

## Overview: investors ponder depth and duration of global downturn

Uncertainty about the depth and duration of the economic contraction continued to roil financial markets over the period between end-November 2008 and 20 February 2009. Credit markets generally remained under pressure from weak economic data and earnings reports and the resulting expectations of rising defaults. Pressures were particularly evident in the renewed widening of non-investment grade spreads. Cyclical deterioration also drove the worsening of equity prices, particularly in Japan.

At the same time, policy measures aimed at stabilising markets appeared to gain traction over the period. In money markets, central bank actions and government guarantees helped to calm interbank markets and spreads between Libor and overnight index swaps (OIS) continued to decline gradually. Facilities that included outright purchases of agency mortgage- and other asset-backed securities contributed to signs of normalisation in mortgage markets, while funding facilities and government guarantees of financial sector issues provided a helping hand to primary debt markets, where activity surged to record levels in January.

To be sure, policy measures backstopping debt claims on banks were generally not perceived as positive for financial shares, and financial sector concerns continued to lead overall equity market losses in the United States and Europe. Meanwhile, the lack of detail on key support packages, among other factors, contributed to elevated levels of implied volatility as well as to price/earnings ratios which were extremely low by the standards of the past two decades.

Uncertainties about the severity of the financial crisis and the economic downturn exerted further downward pressure on government bond yields, though mounting concerns over increased issuance limited overall declines in yield during the period under review. At the same time, segments of the bond market were still showing clear signs of being affected by factors other than expectations about economic fundamentals and policy actions.

Although emerging markets generally had little direct exposure to the distressed asset problem plaguing major industrial economies and managed to weather the most acute phase of the financial crisis in late 2008 relatively well, they were much less immune to the deepening recession in the advanced industrial world. Plunging exports and GDP growth bore clear evidence of the

severity and synchronicity of the global economic downturn, which was reflected in declining asset prices, particularly in emerging Europe.

### Credit markets under pressure from further bank losses

Deeply rooted uncertainty about the global economic outlook subjected benchmark credit default swap (CDS) indices to substantial spread volatility between end-November and late February. Having reached new highs in early December amid rising recession fears, spreads tightened into the new year, only for sentiment to turn down on weak economic data and news of further large-scale losses in the banking sector. When these developments triggered another round of policy efforts aimed at stabilising financial systems, spreads were temporarily pushed lower once again in late January, but they reverted to an upward trajectory in the course of the following month.

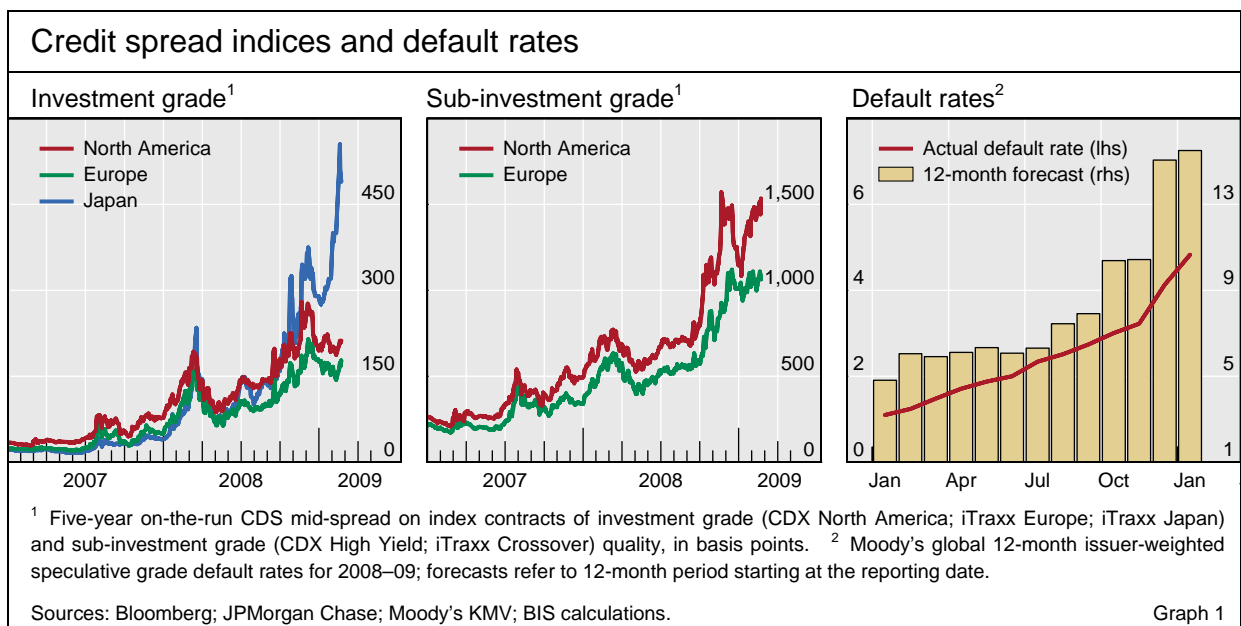
Investment grade spreads generally outperformed those of lower-quality borrowers (Graph 1, left-hand and centre panels). Given continuing problems in the banking sector, the ongoing slowdown in economic activity and constricted credit availability were likely to lead to further fundamental credit deterioration. Default rates, having already increased significantly from the very low levels observed in early 2008, were thus expected to rise further, putting pressure on lower-rated issuers (Graph 1, right-hand panel). In line with these developments, risk tolerance in credit markets remained at depressed levels (Graph 2, left-hand panel). Related uncertainties were also evident from implied volatilities, despite a recent retreat from the record highs established in October 2008 (Graph 2, centre panel).

As a result, by the end of the period under review, the US five-year CDX high-yield index spread had widened by about 148 basis points from its level at end-November to near 1,534, only 38 basis points off its record high in November. Corresponding investment grade spreads, in contrast, declined by 28 basis points, to around 212. European CDS indices broadly mirrored the

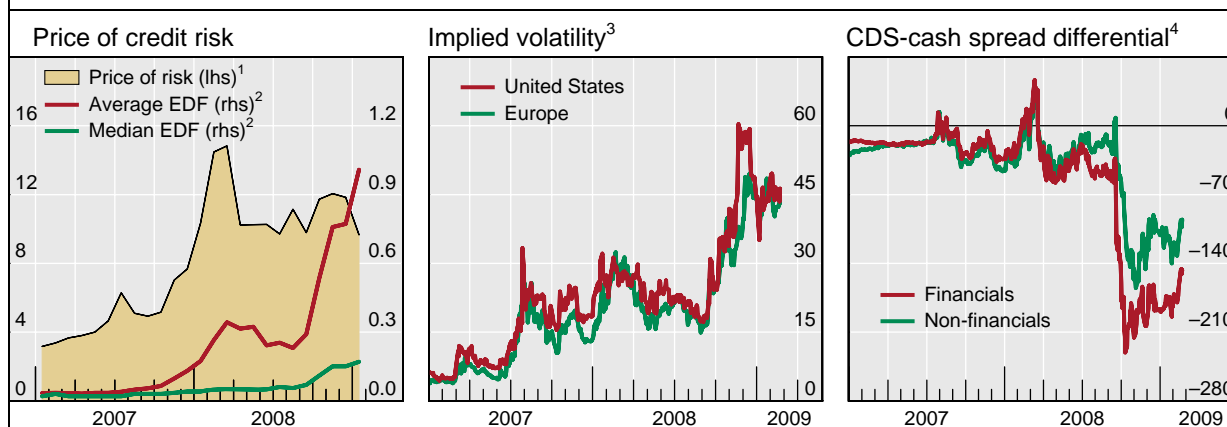
Credit markets are subject to ...

... repeated swings in investor sentiment ...

... amid elevated levels of uncertainty



## Price of risk, credit volatility and CDS-cash basis measures



<sup>1</sup> Ratio of risk neutral to empirical probabilities of default, calculated using the methodology described in J Amato, "Risk aversion and risk premia in the CDS market", *BIS Quarterly Review*, December 2005, pp 55–68. Empirical probabilities are based on Moody's-KMV EDF data. Estimates of risk neutral probabilities are derived from US dollar CDS spreads (document clause MR) and estimates of the recovery rate. The reported ratio is the median in a large sample of investment grade entities. <sup>2</sup> In per cent. <sup>3</sup> Implied daily absolute spread movements; calculated from at-the-money one- to four-month implied volatilities and observed index spreads (CDX High Yield; iTraxx Crossover), in basis points. <sup>4</sup> CDS-cash measures, approximated by the difference between the iTraxx Europe (non-) financials five-year on-the-run CDS mid-spread and the iBoxx (non-) financials cash market spread.

Sources: JPMorgan Chase; Markit; BIS calculations.

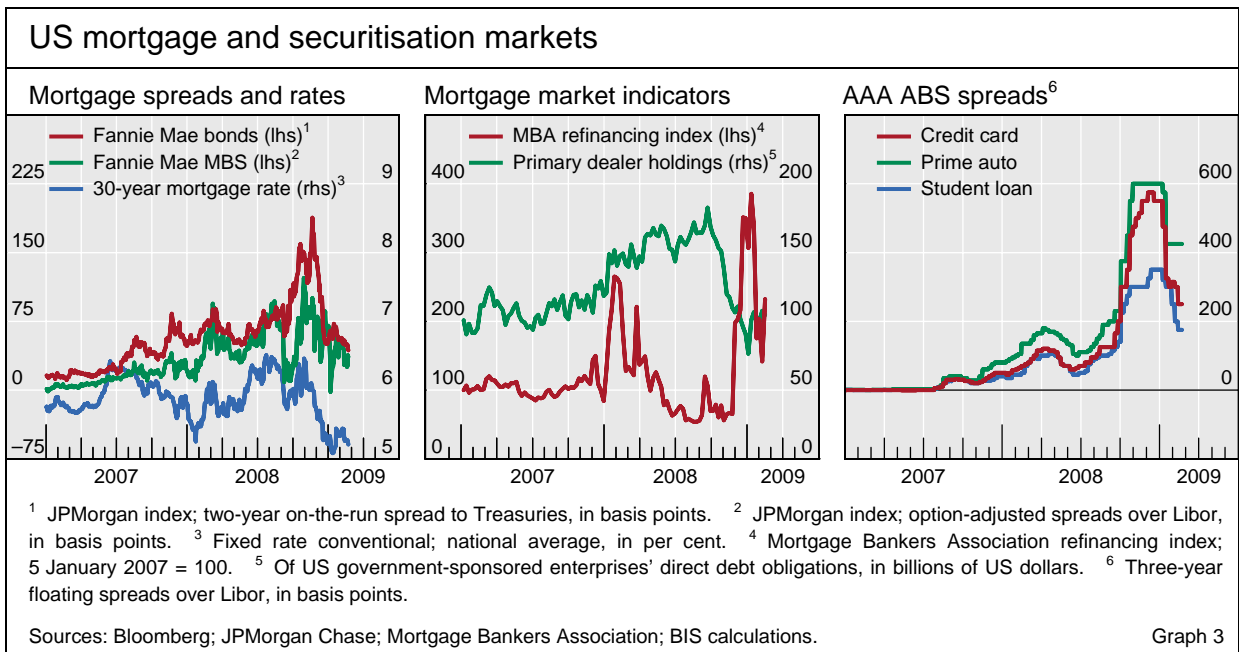
Graph 2

performance of their US counterparts, with investment grade spreads almost unchanged from their end-November levels. Japanese investment grade spreads, on the other hand, widened by 170 basis points (Graph 1, left-hand and centre panels). While being driven in part by a rapidly weakening macroeconomic environment, the move was exacerbated by index composition effects and deteriorating market liquidity, as evidenced by strongly widening bid-ask spreads.

While signs of normalisation are evident ...

One factor supporting credit markets over the period was signs that recent government measures were contributing to improved conditions in key, previously disrupted, segments of the money (see section below) and credit markets. A prime example of a market experiencing tentative, policy-induced normalisation was the US mortgage sector, where agency spreads and mortgage rates continued to ease back from the highs established in October (Graph 3, left-hand panel). Following the announcement by the Federal Reserve, on 25 November, of a programme aimed at outright purchases of agency-related securities, investor demand picked up, as suggested by a significant decline in dealer holdings of agency debt until the end of 2008. Mortgage rates fell sharply, to around 5% for 30-year conventional mortgages. While part of the decline was later reversed on the back of rising Treasury yields, qualifying borrowers were prompted to refinance into lower-cost loans (Graph 3, left-hand and centre panels). Further support came from the substantial Federal Reserve purchases of agency mortgage-backed securities (MBS) that had been announced for the first two quarters of 2009. The size of the programme, at \$500 billion – an average of about \$1.1 billion per trading day – meant that the effect on MBS spreads was felt by the markets even before actual purchases commenced on 5 January. Similar effects were present in the markets for US consumer asset-backed securities (ABS) – which are based on consumer loans rather than mortgages – where spreads at the

... in US mortgage, asset-backed ...



AAA level declined in anticipation of the implementation of the Term Asset-Backed Securities Loan Facility (TALF) in February (Graph 3, right-hand panel).

Another sign of government-assisted normalisation came from primary debt markets, where activity surged to record levels. With a number of country authorities considering outright purchases of corporate bonds, and with guarantee programmes in place to support financial issuers, a long pipeline of pent-up issuance opened up in January. Numerous large corporate bond issues were priced in the dollar, euro and sterling markets, including a dual currency transaction featuring the first European high-yield deal in 18 months. Issuers were generally required to accept wider spreads than those in both the CDS and secondary cash markets, but at these concessionary prices credit supply appeared to be readily available, though only for better-quality borrowers. As a result, global gross corporate issuance reached \$131 billion in January, up more than 150% from the average levels observed over the same month in 2000–08. Supported by government guarantees, activity was also strong in the financial sector, allowing banks to extend the maturity of their market funding (see the Highlights section on p 24).

... and primary credit markets ...

The extension of bank funding in turn appeared to ease pressure in commercial paper markets. In late January, with the first series of issues under the Federal Reserve's Commercial Paper Funding Facility (CPFF) set to mature and CP rates having fallen below the funding costs for CPFF issues, large volumes of paper started to roll back into the broader market. From a level of \$334 billion, the facility's net holdings decreased by about \$85 billion between end-December and late February, accounting for 63% of the \$135 billion reduction in total CP outstanding over the same period; wholesale financing markets thus absorbed the bulk of the maturing CPFF volumes.

At the same time, signs of dysfunction continued, highlighting the fragile state of market conditions and investor sentiment. The fragility was apparent, for example, in measures such as the CDS-cash basis, which reflects the

... broader dysfunctions remain

pricing differential between CDS contracts and corresponding cash market bonds. Though not as pronounced as in the aftermath of the Lehman Brothers bankruptcy, the basis remained unusually wide in the new year, suggesting that arbitrage activities that would usually tend to compress the price differential continued to be constrained by elevated capital and financing costs for leveraged investors (Graph 2, right-hand panel). Similar effects were observed elsewhere, as evident from high and variable liquidity premia in the markets for government bonds and swaps (see bond market section below).

Banks, in particular, remain under strain ...

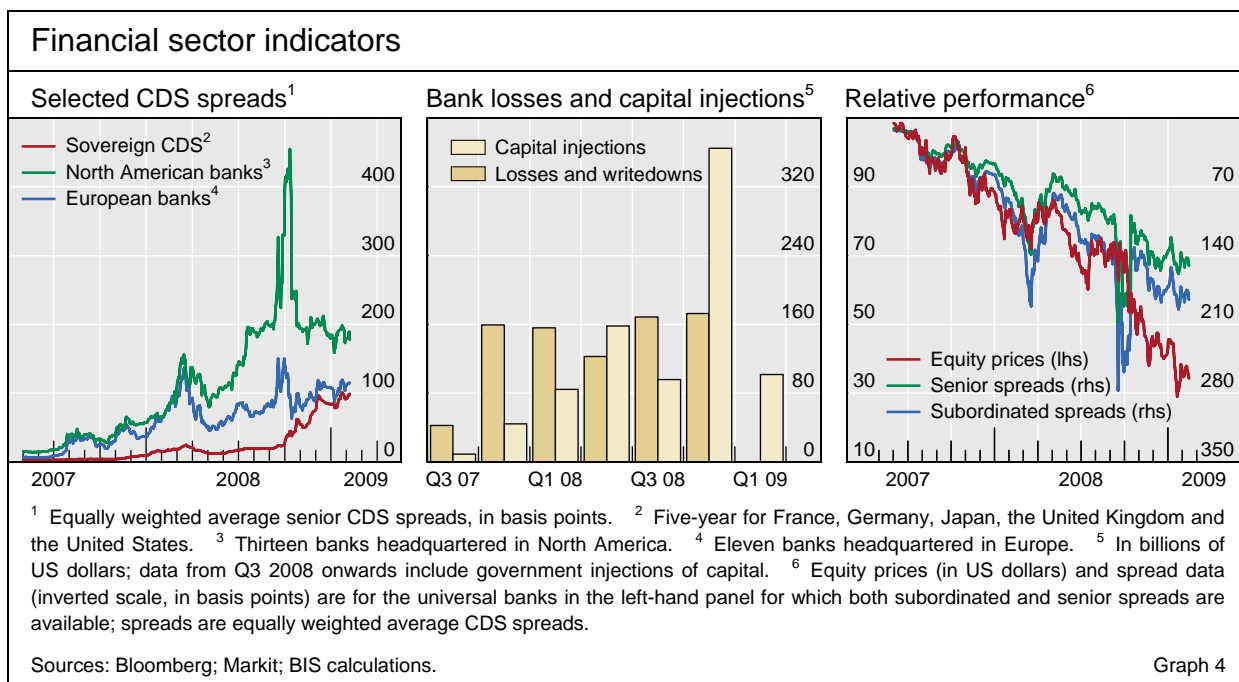
Investor confidence was rattled once again when, despite a combined \$925 billion of private and government capital injected into the global banking sector since the third quarter of 2007, further signs of banking problems emerged in both Europe and the United States. Those problems defeated the view that large-scale government support in the third and fourth quarter of 2008 had restored the sector's stability on a sustained basis. Events started on 8 January, when losses at a newly acquired former rival had to be backstopped by a bailout package for Commerzbank (Table 1), and accelerated as similar news involving other major banks aired during the following week (Graph 4, left-hand and centre panels).

... as evident from pricing across the capital structure

As a result, credit spreads were pushed higher in shallow and volatile markets. While the upward move was led by spreads for financial sector firms, existing guarantees and expectations of further support measures generally served to limit spread movements relative to equity prices (see the equity market section below). Subordinated bank CDS spreads, in turn, remained under pressure from uncertainties about the implications of government interventions for investors in lower-seniority debt instruments, including the treatment of hybrid securities issued to bolster banks' capital positions. Earlier

Selected events over the period under review	
Date	Event
8 January	German lender Commerzbank receives a bailout package to backstop losses at newly acquired Dresdner Bank; the German government takes a 25% stake in the combined entity.
16 January	The Irish authorities seize control of Anglo Irish Bank; Citigroup posts an \$8 billion loss. Replicating an approach taken in the case of Citigroup, the US authorities agree to invest \$20 billion in Bank of America through a preferred equity stake along with guarantees for a pool of \$118 billion of the bank's assets. The measure follows the bank's acquisition of Merrill Lynch earlier in the month.
19 January	Following 2008 losses of about £28 billion at Royal Bank of Scotland, the authorities increase their equity stake in the troubled institution to up to 70%. The move forms part of a further broad-based financial rescue package announced on the same day, which includes the extension of existing guarantees for debt issued by participating banks and offers fee-based protection against losses on asset portfolios of financial institutions.
21 January	The French authorities offer to inject up to €10.5 billion into eligible banks.
26 January	The Dutch authorities grant ING Group a backup facility guaranteeing part of the bank's securitised mortgage portfolio worth \$35 billion.
10 February	Swiss bank UBS reports a fourth quarter loss of CHF 8.1 billion. The US authorities announce a new, comprehensive support package for the financial sector; the plan anticipates an expansion of the scope of existing measures by incorporating commercial MBS into the Term Asset-Backed Securities Loan Facility (TALF) and proposes a public-private investment fund of \$0.5–1.0 trillion to purchase troubled assets from banks.

Sources: Bloomberg; *Financial Times*; *The Wall Street Journal*. Table 1



investor concerns over a large issuer's decision not to call outstanding hybrid securities at the contractual redemption date, in contrast, eased after other borrowers decided to redeem their issues. Related fears about extension risk (ie the risk of maturities on similar securities being extended beyond the agreed call dates) had fed into the markets for subordinated CDS, which are widely used to hedge hybrid instruments (Graph 4, right-hand panel).

Financial sector concerns continued to weigh on spreads in the following weeks, while being counterbalanced in part by a new round of government support measures. A first step in this direction came from the United Kingdom, where earlier efforts to restore financial sector health had proved insufficient: on 19 January, following news of large losses for 2008 at Royal Bank of Scotland, the authorities announced a further broad-based rescue package for UK financial institutions. Authorities in other European countries also took additional support measures in the following days. Those efforts, and reports of plans for a new comprehensive rescue package by the incoming US administration, helped buoy market sentiment in the period up to early February, with US and European investment grade spreads tightening back to levels last seen in November. However, following weak economic data and disappointment about the details of the newly announced US rescue plan, credit spreads drifted upwards once again towards late February.

A new round of government support ...

Reflecting the impact of these new support packages on budget balances as well as the generally depressed level of risk appetite, spreads on sovereign CDS continued to rise over the period. Actual and anticipated negative rating actions contributed to particularly pronounced spread increases for a number of euro area countries, with Greece, Portugal and Spain being downgraded by Standard & Poor's in January. Banking system exposures to particular markets or regions and related concerns about future government support reportedly also played a role. Yet signs of waning appetite for sovereign risk were also

... adds to upward pressures on sovereign spreads

apparent for other countries and outside the CDS market (see the bond and emerging market sections below).

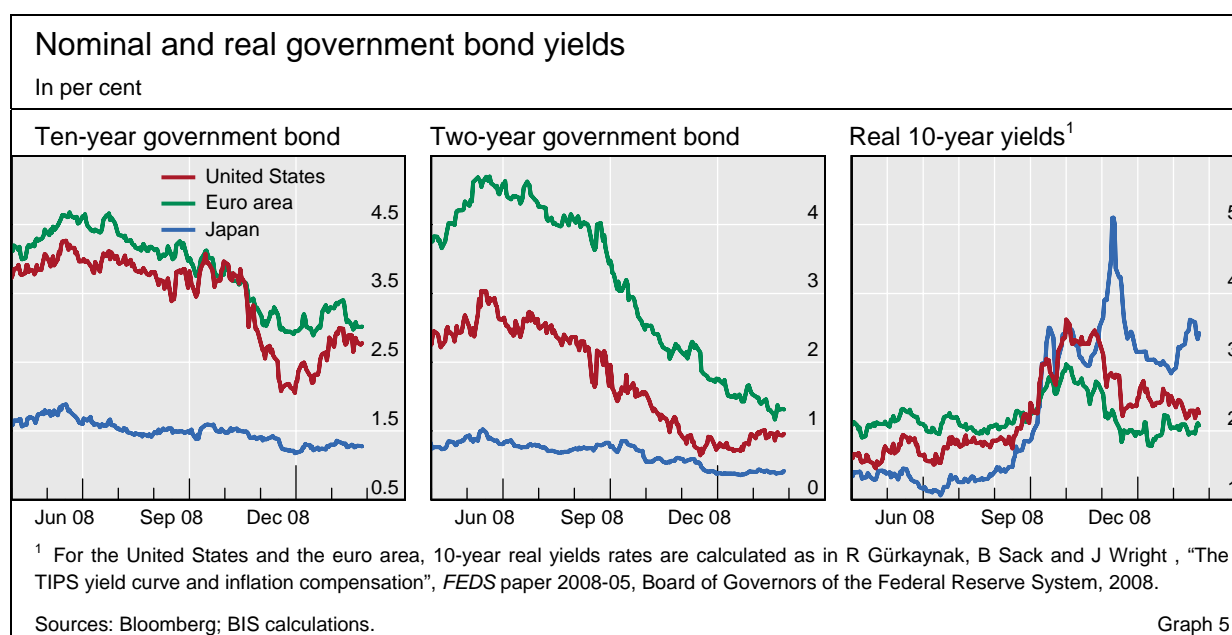
### Fall in government bond yields interrupted by supply concerns

Uncertainties about the severity of the financial crisis and the economic downturn continued to weigh on government bond yields in major bond markets during the period under review. At times, speculation about possible central bank interventions in bond markets contributed to the downward pressures on yields. However, mounting concerns over increased supply of government bonds counteracted these forces, driving yields higher in the first few weeks of 2009, particularly in the United States.

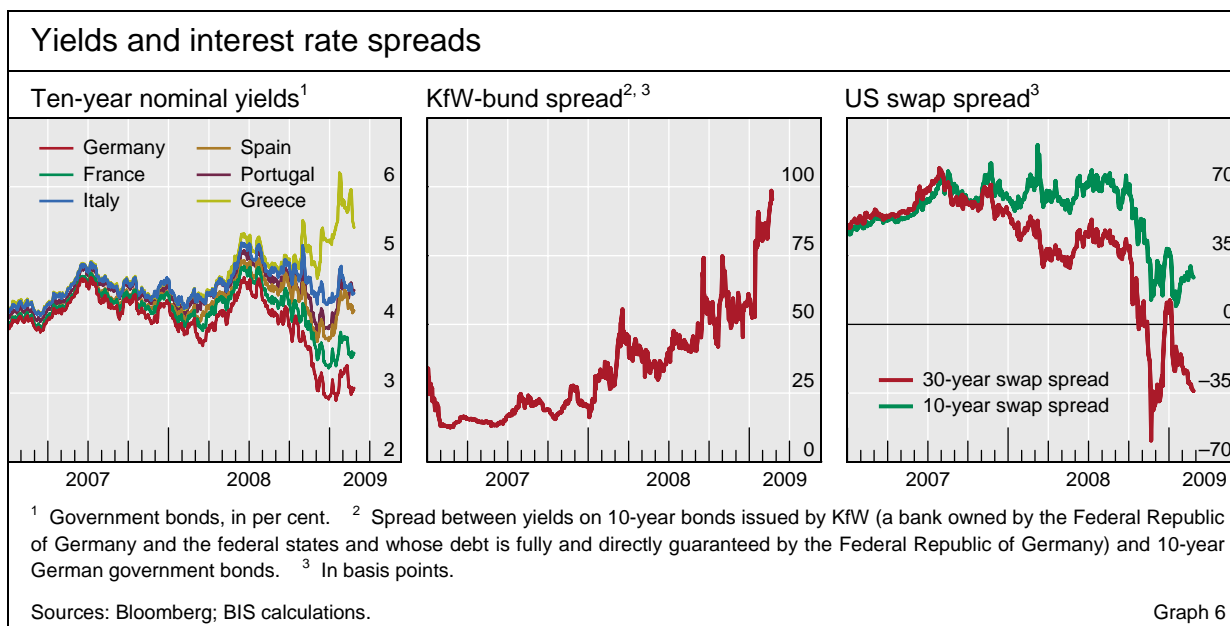
Overall, between end-November 2008 and 20 February 2009, yields on 10-year nominal government bonds fell by around 15 basis points in the United States, 25 basis points in the euro area and 10 basis points in Japan (Graph 5, left-hand panel). These relatively modest yield changes over the period under review were the result of countervailing forces affecting bond prices. In early December, long-term bond yields fell significantly before stabilising and subsequently rising through early January, when a number of risky asset markets saw a brief rally. The rise in yields was temporarily halted in mid-January as the mood of investors soured in the wake of more bad news on the economic outlook and the health of the banking system. Nonetheless, long-term bond yields soon began to rise as supply concerns again took centre stage. Towards the end of the period under review, yields came under some renewed downward pressure as investors worried about the adequacy of the latest US financial sector rescue plan.

The possibility of Treasury purchases by the Fed pushes yields down

In the United States, as the FOMC acted in December to target a federal funds rate of 0–0.25%, speculation intensified among investors on alternative ways in which the Federal Reserve could implement additional easing policies. The fact that such policies might include outright purchases of Treasury bonds







led at times to downward pressure on US long-term yields. The effect was particularly evident in early December, when the Chairman of the Federal Reserve Board referred to the possibility of the central bank purchasing substantial quantities of longer-term Treasury securities; after his remarks, 10- and 30-year yields dropped by around 20 basis points. Similarly, long-term yields plunged about 25 basis points after the release of the December FOMC statement, which mentioned that the Committee was evaluating the benefits of purchasing longer-term Treasuries. The salience of this issue was again apparent following the FOMC statement on 28 January, which disappointed investors given its lack of new details regarding possible outright Treasury purchases and resulted in long-term yields rising 15–20 basis points.

Bond yields continued to show clear signs of being affected by factors other than expectations about economic fundamentals and policy actions. This was particularly evident in the case of index-linked bond markets, where high and volatile liquidity premia and technical factors related to hedging and deleveraging produced unusual swings in real yields. For example, in late November and early December, 10-year real yields on Japanese index-linked bonds rose about 200 basis points, briefly reaching above 5% in the second week of December (Graph 5, right-hand panel). This sharp rise in real yields occurred despite reports indicating that the Japanese economy was suffering its worst downturn in decades. According to market reports, the observed swings in real yields were largely due to the rapid unwinding of positions in the Japanese index-linked market by leveraged investors, including foreign hedge funds.

Technical factors also continued to influence break-even inflation rates in major industrialised countries. While expected rapid disinflation contributed to falling break-even rates at shorter horizons, much of the recent movement in long-term break-even rates seemed to be due to factors not directly linked to inflation expectations. These included rapid unwinding of positions, intense safe haven demand for the liquidity of nominal Treasuries and rising liquidity

Non-fundamental factors continue to affect real yields ...

... and break-even rates



premia in index-linked bonds, all of which helped push break-even rates to unusually low levels (see box). However, with some of these forces easing in early 2009, break-even inflation rates began to edge upwards from their lows.

Bond yields rise on supply worries ...

Concerns about the increased supply of government bonds counteracted the downward pressure on yields resulting from safe haven demand and the worsening economic outlook and ultimately pushed yields higher. As the supply of government debt has been rising, signs have also emerged that governments may be finding it more challenging to raise money in bond markets. Moreover, growing volumes of corporate issuance and government-guaranteed bank debt have meant that governments are facing increasing competition for investors. Some euro area countries have recently cancelled debt auctions because of a lack of demand, and even new issuance by Germany has met with lower demand. In the past few months, Germany has, on a number of occasions, failed to attract sufficient bids (at fixed prices) in the primary market to cover the entire amount offered.

... and uncertainty about sovereign credit risk ...

Uncertainty about the sovereign credit risk implications of large and rapidly rising fiscal deficits, linked to outsize stimulus packages and government bank guarantees, seemed to contribute to rising yields as well. Such concerns were also partly behind the continuing widening of spreads between yields on German bunds and on government bonds of other euro area countries, some of which suffered rating downgrades (see the credit market section). In addition to these concerns, the fact that the market for treasuries in individual euro area countries is in many cases significantly less liquid than the market for bunds is likely to have played an important role too, as investors' appetite for securities with low liquidity dwindled further. The considerable widening of spreads on government-guaranteed bonds issued by KfW (a German state-owned bank) relative to German bunds suggests that liquidity and other factors distinct from credit risk were key drivers of the recent spread widening.

... while investors expect short-term rates to remain low

Short-term yields continued to fall or remained very low from December 2008 through to late February 2009 (Graph 5, centre panel). The low rates reflected ongoing safe haven demand for short-dated government debt as well as the actual and expected easing of monetary policy in an environment in which the near-term economic outlook remained extremely bleak. In line with this, the pricing of federal funds futures suggested that US policy rates were expected to edge upwards from near zero levels only very gradually (Graph 7, left-hand panel). In the case of Japan, overnight index swaps were pricing in rates at essentially zero for the foreseeable future (Graph 7, right-hand panel). In the euro area, where policy rates are not close to their floor, implied forward overnight rates shifted further downwards (Graph 7, centre panel).

Money market conditions improve slowly

In money markets, the situation continued to improve slowly, as central bank actions and government guarantees gradually gained traction. Libor-OIS spreads, for example, edged further downwards, although by late February they were still at levels above those seen during the first year of the financial market turmoil (Graph 8, left-hand panel). To some extent, the still elevated levels of Libor-OIS spreads reflected the fact that bank credit risk and

## Disentangling the drivers of recent shifts in break-even inflation rates

Peter Hördahl

In recent months, break-even inflation rates, ie the difference between yields on nominal and real bonds, have been abnormally volatile, falling to unprecedentedly low levels before recovering somewhat in early 2009. The US 10-year break-even rate, for example, dropped to almost zero in late 2008 after having remained relatively stable at around 2.5% over the past several years (Graph A, left-hand panel). A similar pattern, albeit less pronounced, has been seen in euro area break-even rates (Graph A, centre panel).

A natural question to ask is: to what degree should these recent fluctuations be viewed as representing actual changes in expected inflation? Break-even inflation rates have long been used as an indicator of the markets' inflation expectations over the horizon of the bonds. Of course, during the financial crisis, the huge price swings in many markets, including those for nominal and index-linked bonds, have partly reflected "non-fundamental" factors. All in all, while falling inflation expectations are likely to have contributed to the drop in break-even rates, a substantial part of the decline was probably due to other factors, including liquidity and "market technicals".

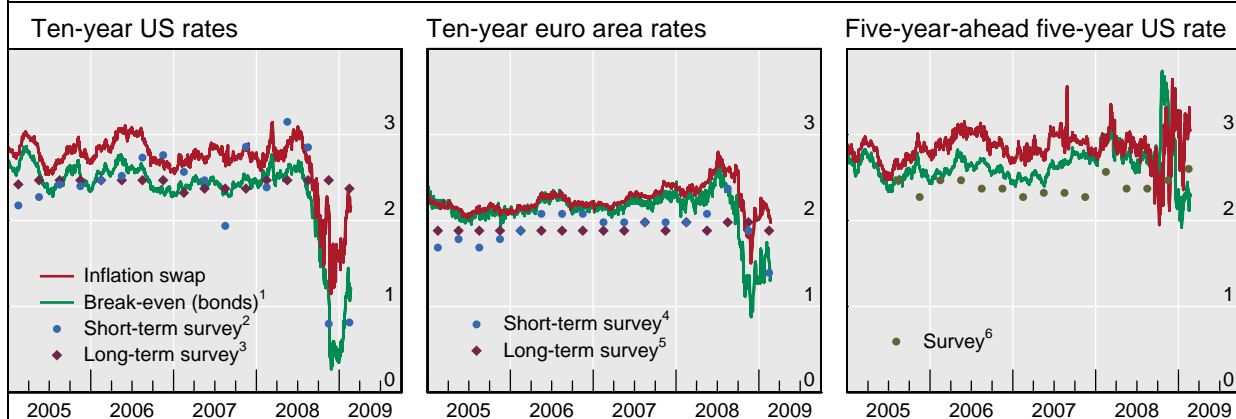
Generally speaking, break-even rates can be thought of as consisting of four major components: (i) expected inflation; (ii) inflation risk premia; (iii) liquidity premia; and (iv) "technical" market factors.<sup>9</sup> The relative importance of these components may vary over time as conditions in the economy and in financial markets change.

One way to assess the role of the first component is to look at other indicators of inflation expectations, such as survey data. According to the Survey of Professional Forecasters (SPF) conducted by the Federal Reserve Bank of Philadelphia, one-quarter-ahead expectations of US inflation fell from 2.9% in Q3 2008 to 0.8% in Q1 2009, but 10-year inflation expectations dipped only 0.1%, to 2.5%. Similarly, even though euro area short-term inflation expectations dropped significantly in recent months, the ECB's SPF also reported a drop of only 0.1% in long-term (five-year-ahead) inflation expectations, to 1.9%, between Q3 2008 and Q1 2009. This pattern suggests that average inflation expectations for the next few years have remained stable despite rapidly falling near-term expectations. However, some have questioned the plausibility of continued stable average inflation expectations over long horizons in view of the very large shocks that have hit the economy recently.

As regards the inflation risk premium, recent estimates suggest that this component has tended to be relatively small and fairly stable.<sup>9</sup> If so, it is unlikely that the inflation premium has been responsible for a major part of the observed changes in break-even inflation rates. Nevertheless, some estimates suggest that inflation risk premia are positively correlated with

### Break-even inflation rates and survey forecasts

In per cent



For the United States, expectations are calculated as the median of the sample; for the euro area, the mean.

<sup>1</sup> For the United States and the euro area, zero coupon break-even rates are calculated as in R Gürkaynak, B Sack and J Wright, "The TIPS yield curve and inflation compensation", *FEDS Paper* 2008-05, Board of Governors of the Federal Reserve System, 2008. <sup>2</sup> One-quarter-ahead CPI inflation expectations. <sup>3</sup> Ten-year CPI inflation expectations. <sup>4</sup> One-year-ahead HICP inflation expectations. <sup>5</sup> Five-year-ahead HICP inflation expectations. <sup>6</sup> Five-year CPI inflation expectations, five years ahead.

Sources: Bloomberg; Federal Reserve Bank of Philadelphia Survey of Professional Forecasters (SPF) and ECB SPF; BIS calculations.

Graph A

inflation, implying that the recent decline in inflation could have brought about a lower inflation premium in line with falling break-even rates. Yet it seems intuitively reasonable to assume that the inflation risk premium may have increased, given higher inflation volatility and uncertainty about the possible effects on prices of recent monetary policy actions.

Liquidity premia, broadly defined, do seem likely to have played a large role in break-even developments. Strong flight-to-liquidity flows during the market turmoil led to soaring demand for nominal government bonds, probably inducing a negative premium in this segment. In other words, nominal yields were pushed to extremely low levels by this effect, which in turn led to strong downward pressure on break-even rates. In addition, because markets for index-linked bonds are substantially less liquid than those for nominal bonds, there is a higher risk that investors in index-linked bond markets will encounter problems when quickly trying to exit positions at prevailing market prices. In normal times, this is typically seen as generating a relatively small liquidity premium on index-linked bonds. That type of premium probably increased considerably as liquidity risk rose, and aversion to such risk grew when the crisis deepened in the second half of 2008. This, in turn, would have increased the yield on real bonds relative to that on nominal bonds, hence adding to the downward pressure on break-even rates.

Linked to these liquidity effects, and to some extent indistinguishable from them, are technical market factors, which also appear to have been important drivers of break-even rates recently. Such factors include sell-side pressures from leveraged investors that were forced to unwind inflation-linked bond positions in adverse market conditions, which in turn resulted in rising real yields and hence falling break-even rates.<sup>③</sup>

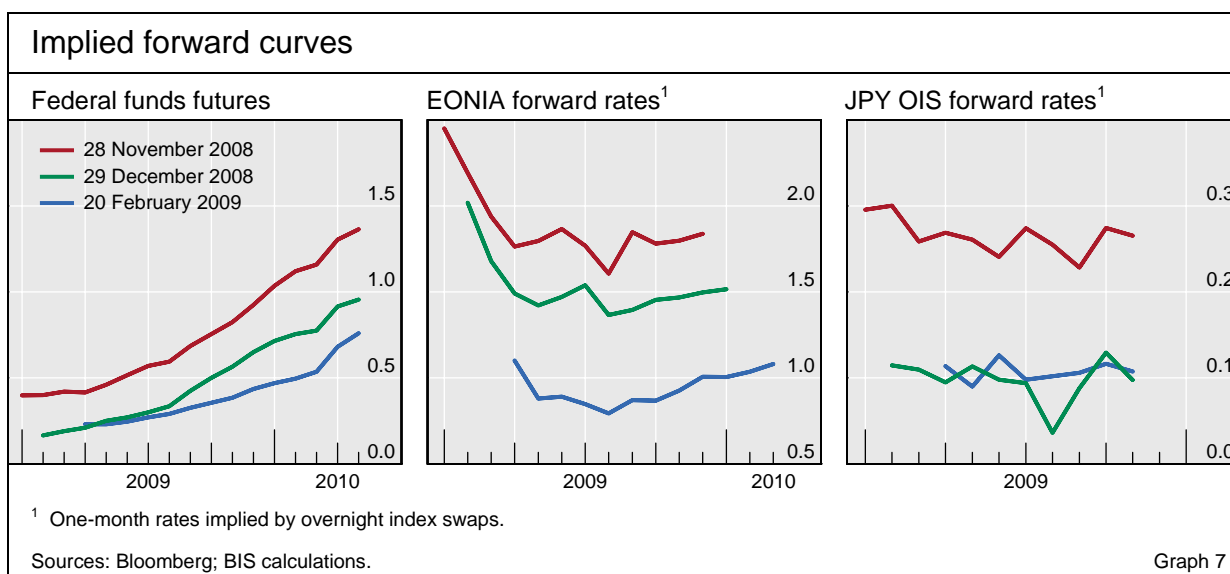
Evidence from inflation swap markets can shed some light on the importance of these effects. An inflation swap is a derivative instrument that is similar to a regular interest rate swap. However, instead of exchanging a fixed payment for a variable payment linked to a short-term interest rate, the inflation swap links the variable payment to a measure of inflation, typically the accrued inflation over the life of the swap. The fixed leg of the inflation swap therefore provides a direct break-even inflation “price”, which is unaffected by any differential liquidity conditions in nominal and real bond markets or by flight-to-liquidity flows.<sup>④</sup>

While the difference between 10-year inflation swap prices and corresponding bond break-even rates had remained stable in the past few years, the spread widened significantly towards the end of 2008 (Graph A, left-hand and centre panels). This suggests that the aforementioned liquidity and technical effects have played a significant role in bond market break-even rates. Nevertheless, inflation swap rates also declined notably in late 2008, a move consistent with expectations of lower inflation but probably also due to hedging of break-even positions in bond markets. Some of the declines in break-even rates were reversed in early 2009, possibly as a result of investors stepping in to take advantage of what was perceived as overly depressed break-even inflation levels.

Finally, a look at distant forward break-even inflation rates can be informative. For example, the five-year forward rate five years ahead is often seen as providing a cleaner indication of long-horizon inflation expectations than, say, a 10-year break-even rate because it should, at least in principle, be unaffected by near-term inflation expectations. Such forward break-even rates have become much more volatile in recent months, but there has been no clear shift in their overall level (Graph A, right-hand panel). The absence of such a shift would suggest that longer-term inflation expectations have remained broadly stable, which is in line with the view that the credibility of central banks with respect to their commitment to price stability has not been eroded despite the recent rapid lowering of policy rates.

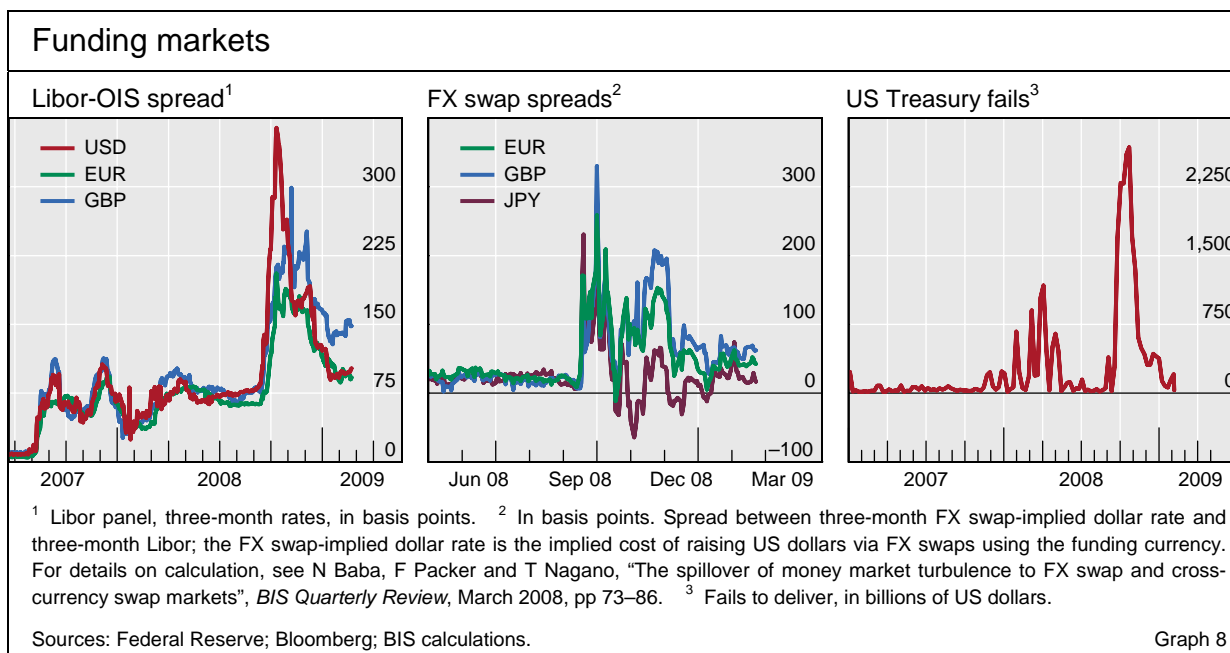
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<sup>③</sup> Other phenomena can affect break-even rates, including inflation seasonality and “carry” effects. Inflation seasonality effects refer to known seasonal fluctuations in consumer prices affecting prices on bonds linked to consumer price indices that are not seasonally adjusted. Carry effects have to do with persistent changes in consumer prices, such as those due to oil price movements, which are known to affect inflation today, whereas index-linked bonds are linked to an index of prices several months old. However, these effects tend to be important mainly for short maturities, say up to a couple of years. <sup>④</sup> See P Hördahl, “The inflation risk premium in the term structure of interest rates”, *BIS Quarterly Review*, September 2008, pp 23–38, and references therein. <sup>⑤</sup> Another such technical factor is the value of the embedded deflation floor, which for many index-linked bonds has increased recently, in particular for newly issued bonds that are close to the floor. Increased deflation floor values imply higher prices for those index-linked bonds that are affected, meaning lower real rates and hence higher break-even rates. This last effect would therefore not explain the recently observed fall in break-even rates. In addition, in our calculations of zero coupon real rates and break-even inflation rates, we do not include any recently issued real bonds. It is therefore likely that the deflation floor has played a minor role in our break-even inflation data. <sup>⑥</sup> Of course, this is not to say that inflation swaps are unaffected by any “technical” market factors, such as hedging effects. In addition, inflation swap markets are typically less liquid than bond markets.



associated premia in early 2009 were higher than before the Lehman bankruptcy (Graph 4, left-hand panel). As with spreads in unsecured lending markets, foreign exchange swap spreads retreated gradually from the highs reached in November, but not back to pre-Lehman levels (Graph 8, centre panel). Conditions seemed to improve in repo markets as well. In particular, US settlement fails, which had reached record levels in October 2008, declined significantly due to easing tensions in funding markets, lower repo trading volumes, and actions taken by the Treasury Market Practices Group (TMPG), a group of private sector market participants sponsored by the Federal Reserve Bank of New York. A settlement fail occurs when a security is not delivered on the date agreed by the buyer and seller, often in connection with a repo transaction. The TMPG recommended the introduction of new market practices, including a charge for failing to settle transactions on time. By mid-February, fails to deliver US Treasuries stood at just over \$30 billion, compared with almost \$2.7 trillion in October (Graph 8, right-hand panel).

Long-term dollar swap spreads (ie the swap rate minus a corresponding Treasury yield) remained at unusually low levels in early 2009 after having fallen substantially in late 2008. Some of the downward pressure was due to Treasury supply concerns pushing up bond yields relative to swap rates. Swap spreads at the 10-year maturity fell to 10–30 basis points in late 2008 and early 2009, compared with a range of about 50–80 basis points during the preceding two years (Graph 6, right-hand panel). Meanwhile, the 30-year US swap spread dropped from a level of around 40 basis points to below zero for the first time ever in late October 2008 and remained negative during much of the period thereafter. Apart from worries about Treasury supply, this sharp decline in very long-term US swap spreads was reportedly also due to hedging of exotic derivative structures.



## Financial sector concerns weigh on equity markets

Equity markets  
struggle ...

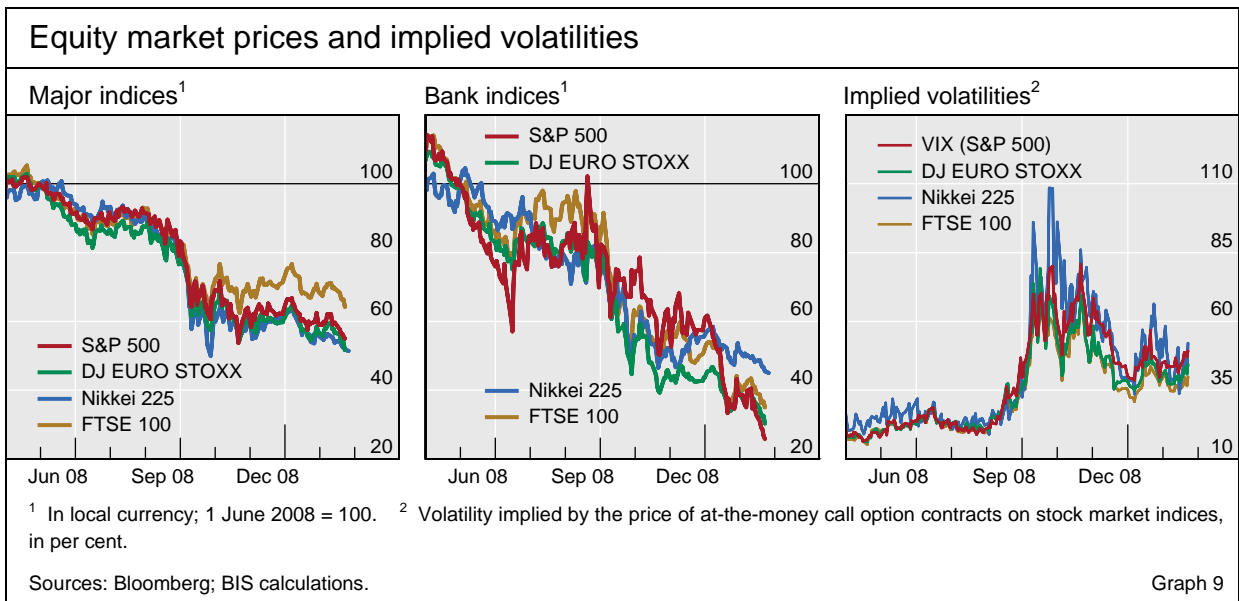
Despite having started 2009 on a strong note, major equity markets performed poorly overall during the period under review, battered by further instances of financial sector problems and a deepening economic downturn. Between end-November 2008 and 20 February 2009, the S&P 500 index fell by 14%. Major bourses in the euro area suffered commensurate losses, while the FTSE 100 shed more than 9% during the same period (Graph 9, left-hand panel).

... amid financial  
sector concerns ...

Heavy selling in financial sector shares led the way down, fuelled by revelations of outside fourth quarter losses at financial firms on both sides of the Atlantic (see Table 1 in the credit market section). At the same time, new instances of government intervention via large-scale capital injections or outright nationalisations heightened concerns about the state of the troubled sector and the implications of increased government involvement, further hurting investors' appetite for financial sector shares. Against this backdrop, the S&P 500 financial sector sub-index fell by some 40% between the start of the year and 20 February, reaching its lowest levels in over 14 years (Graph 9, centre panel). Financial sector stocks in the United Kingdom were also hit hard, losing about 30% over the same period. The declines in financial sector shares in other European bourses were initially less severe than those in the UK market, but accelerated in the third week of February amid mounting concerns about bank subsidiary exposures to deteriorating eastern European markets (see emerging markets section).

... as well as weak  
data and earnings  
reports

The deepening cyclical downturn of major economies also dragged on equity markets. Macroeconomic data releases in January and February continued to point to weakness in the real economy and, in some cases, suggested that activity was in the midst of the worst deterioration in decades. Lacklustre fourth quarter earnings reinforced the gloom already evident in data releases. The impact of recession on corporate performance was particularly



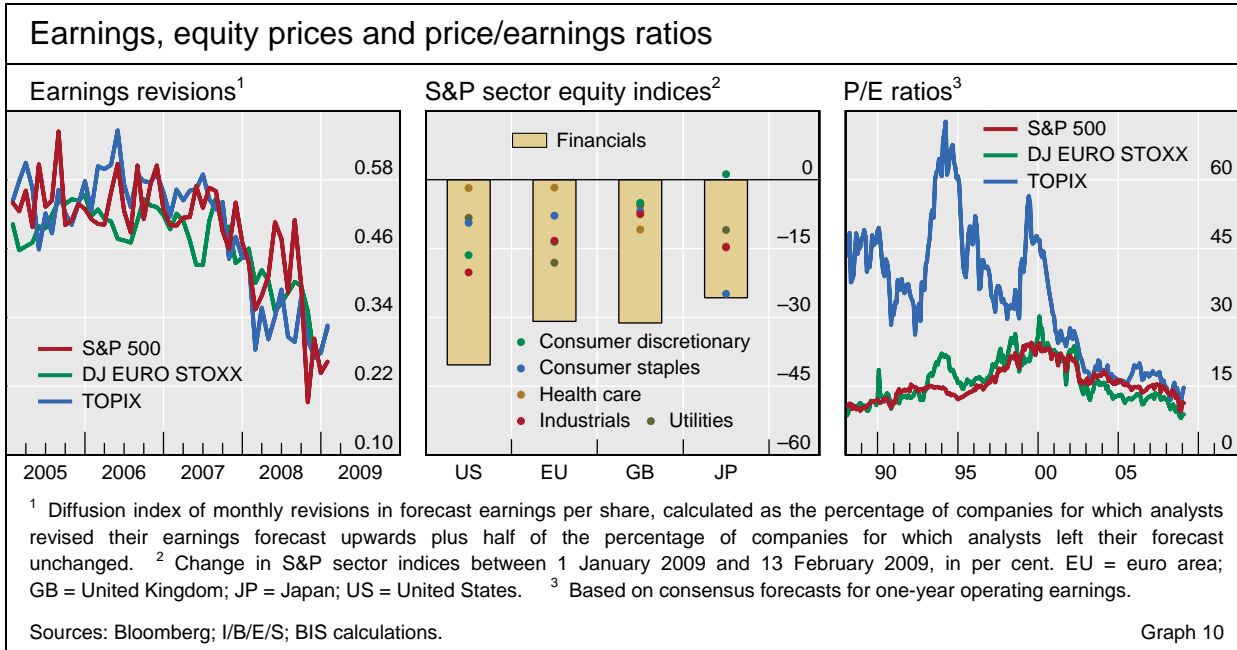
notable in Japan. The Nikkei 225 index fell by some 16% between the start of the year and 20 February, to levels last seen during the more turbulent times of late October. Moreover, the decline of the Japanese market continued to be paced by the consumer goods sector; only in February did the accelerated losses in the financial sector take the lead (Graph 10, centre panel). The strength of the yen, which had appreciated some 20% against the US dollar over the final four months of 2008, hurt export-oriented corporations and their stock prices. The Bank of Japan's 3 February announcement of plans to purchase equity holdings from financial firms did not meet any significant reaction from the market.

In the financial sector, where spreads on senior credit generally narrowed in response to government measures (see credit market section), share prices tended to react poorly. Outright nationalisations, as in the case of Anglo Irish Bank in mid-January, obviously proved devastating for shareholders. Actions that increased the government's equity stake, such as the conversion of Royal Bank of Scotland preferred shares to common shares, also tended to dilute existing shareholders' rights. Although the dilutive effects were often mitigated by the injection of non-equity capital, the conditions attached to such support (eg restrictions on dividend payments) still weighed on share prices. Moreover, with market participants increasingly scrutinising not only the level but also the composition of capital at financial institutions, the fact that many financial institutions might convert hybrid capital instruments into equity shares raised further concerns about dilution.

Other potential government rescue measures also influenced financial sector share prices. Proposals for dealing with banks' bad assets raised uncertainty, as the impact on banks' balance sheets depended on, among other details, the format of the scheme (eg guarantee or outright purchase) and the valuation of assets. Unable to meet market participants' expectations for details, the much awaited announcement on 10 February of the revamped US plan to rescue the financial sector triggered another bout of equity selling, wiping out part of the modest gains accrued after the sell-off in mid-January.

Government interventions depress share prices ...

... as does uncertainty over policy responses to bad assets



The remaining gains evaporated in the third week of February, as heightened worries about possible bank nationalisations haunted financial markets.

P/E ratios still close to historic lows

Much uncertainty remained at the end of the period under review, as suggested by the rebound in volatility measures implied by equity options pricing during the third week of February (Graph 9, right-hand panel). Price/earnings ratios continued to tread at extremely low levels by the standards of the past two decades, even as earnings expectations appeared to be still on the decline (Graph 10, right- and left-hand panels).

### Emerging markets join global slowdown

Emerging markets generally had little direct exposure to the distressed assets that plagued the major industrial economies, and they weathered the acute phase of the financial crisis in late 2008 relatively well. However, they appeared much less immune to the deepening recession in the advanced industrial world. Indeed, evidence of the macroeconomic repercussions mounted throughout the period under review. At the same time, financial market tensions continued to build in selected emerging market economies, especially in eastern Europe.

Sharp and broad-based slowdown in activity ...

The severe and broad-based nature of the global economic downturn was apparent in an array of macroeconomic data releases early in the new year. Singapore's advance fourth quarter GDP estimate (a 2.6% year on year decline), released on 2 January, was among the first to confirm the deepening impact of global downturn on small open economies. The sharper than expected fall in fourth quarter GDP growth in Korea (3.4% down year on year), published on 22 January, bore further evidence to this effect. Among the larger emerging economies, China reported GDP growth of only 6.8% year on year in the fourth quarter, significantly down from 9% in the previous quarter. Similarly, Russia's preliminary corresponding figure, announced on 6 February, came in at only 1.1%, down from 6.2%.



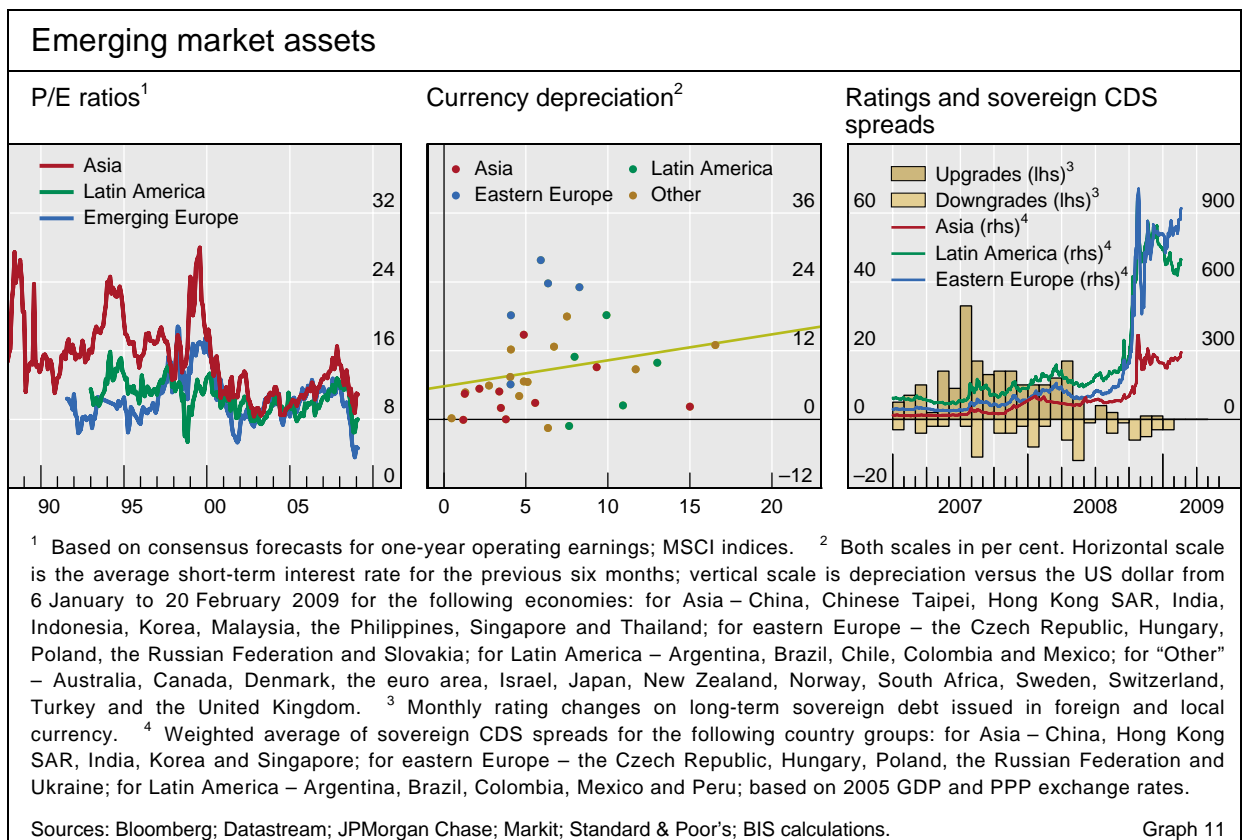
One channel for macroeconomic spillovers from the slowing advanced economies to the emerging market world was export demand. The sharp decline in export growth, already becoming evident for some economies in late 2008, raised particular concerns among those that had depended on exports to support GDP growth. The collapse in trade flows was apparently also linked to the drying-up of trade credit from the industrial world in the wake of the Lehman bankruptcy in September 2008. Available monthly balance of payments figures for Brazil and Korea, for example, indicate that the net flows of trade credit from non-residents turned negative in October 2008 and stayed so up to December.

... accompanied by collapse in trade flows

The deteriorations in economic activity and outlook in emerging markets were reflected in generally depressed equity valuations, particularly in eastern Europe. Between end-November 2008 and 20 February 2009, while the MSCI emerging market indices for Asia and Latin America were flat and up 3%, respectively, the corresponding index for emerging Europe fell by 17%. Valuations, as evident in price/earnings ratios, remained at or close to all-time low levels for all regions (Graph 11, left-hand panel).

Equity valuations remain depressed, especially in emerging Europe

The underperformance of equities in emerging Europe was apparent across a wide range of countries. The benchmark indices of the Czech, Hungarian and Polish stock exchanges fell by over 24%, 18% and 19%, respectively. Russia's Micex index was extremely volatile, climbing by 31% between 23 January and 10 February before plunging by 14% in just three days in mid-February, triggering a temporary suspension of trading on 17 February.



Currency depreciations raise foreign debt concerns

The vulnerabilities of eastern European economies were also highlighted in the foreign exchange markets. Although many emerging market currencies rebounded in December and early January, the Russian rouble continued to depreciate against both the dollar and the euro, as the Russian central bank progressively lowered the currency's trading band amid growing concerns about the country's economic outlook. The Czech koruna, the Hungarian forint and the Polish zloty also suffered sharp losses, which outstripped the declines suggested by the tendency for high-yielding currencies to depreciate more than lower-yielding ones in times of heightened market volatility (Graph 11, centre panel). Given the high exposure of the three economies concerned to a rapidly slowing western Europe via trade and financial links, their ability to finance their sizeable current account deficits and service their foreign currency debt was increasingly called into question. The banks that had been providing financing, mostly subsidiaries of western European banks, were in turn exposed to the worsening outlooks in their host markets. The risk of such two-way exposure was highlighted by a credit rating agency report on 17 February. The news prompted a sell-off in the euro and in eastern European currencies.

Sovereign credit spreads reflect increased differentiation

Investor concerns over selected emerging market economies were echoed in the evolution of sovereign credit spreads. In December and early January, spreads on emerging market sovereign credit in both cash and CDS markets generally retreated from their October peaks (Graph 11, right-hand panel). Notably, the decline in spreads led a number of sovereign issuers to take advantage of the improved conditions around the turn of the year to issue in the primary market. However, the improvement applied mostly to sovereigns from Asia and the better-rated Latin American issuers. Spreads for lower-rated Latin American sovereigns such as Venezuela, in contrast, did not substantially narrow. Meanwhile, spreads for eastern European countries tended to continue rising. Between end-November and 20 February, the five-year CDS spreads for Hungary and Poland, for example, rose by 175 and 180 basis points, respectively, reaching levels close to or beyond their peaks in late October. Extremely wide spreads for Ukraine rose further amid deterioration in the country's economic and political situation.

Though spreads for the better-rated sovereigns were mostly able to sustain their earlier improvements, many appeared to be creeping upwards in late January and February. Most notably, the five-year CDS spreads for Korea widened by over 100 basis points in the second and third weeks of February amid renewed concerns over the ability of Korean banks to service their foreign currency debt.