Benjamin H Cohen
(+41 61) 280 8921
benjamin.cohen@bis.org

Eli M Remolona
(+41 61) 280 8414
eli.remolona@bis.org

1. Overview: financial markets prove resilient

The terrorist attacks in the United States on 11 September brought uncertainty in global financial markets to a new level. During the summer, fading hopes for economic recovery had already weakened the major stock markets and problems in emerging markets had resurfaced. There were declines in most categories of international financial flows in the second quarter and at the start of the third, as borrowers moved to trim investment plans and restore balance sheets. The attacks shook consumer and business confidence still further and reinforced prospects for a broad global slowdown. Nevertheless, once the initial shock had worn off, markets again began to anticipate a recovery during the course of 2002, despite continued unfavourable macroeconomic data.

The immediate effect of the tragic events was to disrupt the functioning of some markets and induce investors to shift into less risky assets. US equity markets closed for four days, while those of Europe and Asia, which remained open but halted trading in the shares of US-based companies, saw stock prices retreat. When US stock exchanges reopened, prices there also dropped sharply, although by less than many had expected. The damage in New York to the operations of inter-dealer brokers, communications links and some clearing and settlement systems temporarily disrupted the functioning of segments of US fixed income markets.

Under the circumstances, the functioning of most markets and the confidence of participants proved remarkably resilient. Monetary authorities injected liquidity through open market operations, discount lending and currency swap arrangements and backed up these moves by reducing policy rates. Within a week of the attacks, most fixed income markets were functioning again, albeit with reduced capacity. Towards the end of September, issuance volumes in the corporate bond market rebounded, and by mid-October stock markets had returned to pre-attack price levels. While investors now expected the global slowdown to be more pronounced, they continued to exhibit confidence that a recovery would take place by mid-2002. These views were underpinned by the prompt easing of monetary policy in several countries and, in the United States, the added stimulus of a more expansionary fiscal policy.

This attitude of persistent medium-term optimism did not extend to the emerging economies. Increased risk aversion and worries about the impact of

the slowdown in the industrial countries led to higher risk spreads and portfolio outflows from several emerging markets, though not all. Emerging economies running current account deficits were affected by the sharp global slowdown in financing through the international banking and securities markets. The problems of specific borrowers, such as Argentina and Turkey, also weighed on market sentiment. Nevertheless, financial market contagion from these countries to other emerging markets appeared limited.

Attacks disrupt market functioning

Terrorist attacks disrupt several financial markets ...

The loss of life and the damage to infrastructure in downtown Manhattan as a consequence of the 11 September attacks led to major disruptions in financial markets. The US stock market closed for four trading days, its longest closure since the 1930s. US bond markets for outright trades closed for two days, and moved to longer settlement periods when they reopened. In the federal funds interbank lending market, the dislocation of inter-dealer brokers and telecommunications problems hindered the matching process between borrowers and lenders. Under a "gentleman's agreement", on the day of the attack all federal funds transactions were performed at the Federal Reserve's target rate rather than at a market-clearing rate. In Europe, some financial institutions briefly faced a shortage of dollars with which to settle currency trades and also experienced an increased precautionary demand for non-dollar liquidity.

... particularly those linked to US Treasury securities

The US Treasury bond cash and repo markets were particularly hard hit, because of the infrastructural and human losses suffered by several inter-dealer brokers, damage to communications links and the dislocation of a major clearing bank from its primary operating facilities. Together, these problems prevented the settlement of billions of dollars' worth of repo transactions for a few days following the attacks. This led to an unprecedented rise in the number of "failed" transactions in Treasury cash and repo markets, which in turn boosted demand for specific Treasury securities, in particular the most recently issued notes. Disruptions to the functioning of short-term money markets contributed to an increase in activity in the corresponding derivative instruments, as participants sought alternative channels for hedging and position-taking (see "Derivatives markets" on page 29).

Prompt action by monetary and fiscal authorities helps restore market functioning

Monetary and fiscal authorities were quick to respond. In the days following the attacks, the Federal Reserve injected ample amounts of liquidity into the banking system through repo operations and the discount window. In a jointly issued statement that helped to stem the flight to safety, the finance ministers of the G7 countries declared their commitment to minimising any "disruption to the global economy". Swap arrangements between the Federal Reserve and several central banks eased concerns about a shortage of dollars available to foreign financial institutions.

Official action, the restoration of communications links and cooperation among market participants enabled most markets to function more or less normally again within a week of the attack. The intraday volatility of federal

funds rates remained exceptionally high into October, but owing to the Federal Reserve's injections of liquidity, the effective rate was never much above target.

Normal market functioning returned last to the repo market, where high levels of failed transactions persisted into October. Indeed, the number of failed trades mounted in the weeks immediately following the attacks. This led to a collateral supply problem as lenders of securities withdrew from the market. To remedy the situation, the Federal Reserve promptly waived some restrictions on its securities lending programme, offering securities in short supply in exchange for those that were more easily available. Between the day of the attacks and the end of September, the Fed lent a total of $70 billion in par amounts of Treasury securities. On 4 October, the US Treasury provided a further boost to the supply of government paper by issuing $6 billion of 10-year notes in an unscheduled reopening of a previous issue. By mid-October, the rate of repo market fails had dropped to moderate levels.

Stock markets quickly regain confidence

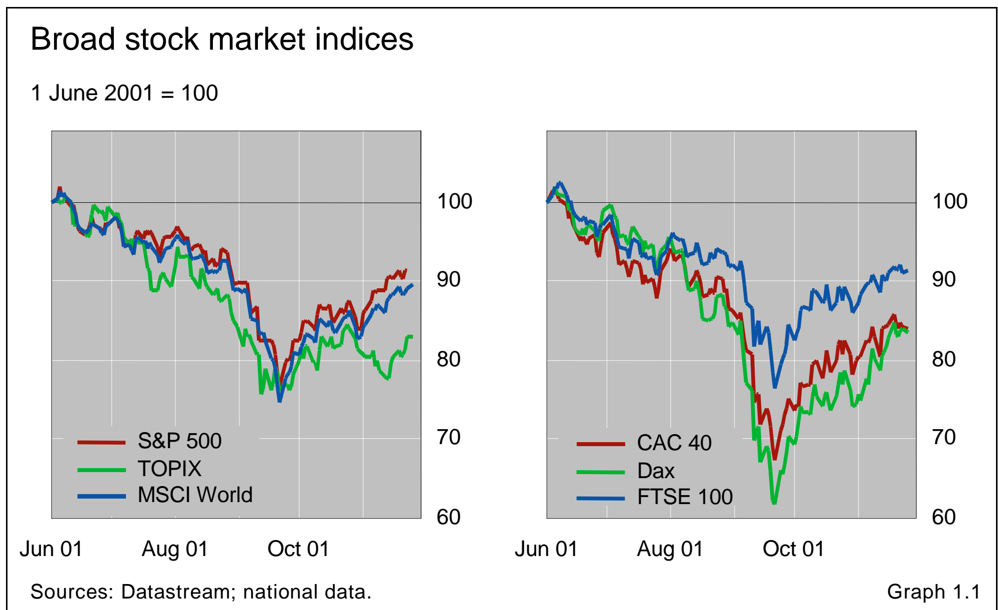
Disappointing economic news cause market declines before 11 September ...

Even before 11 September, the news about the global economy had not been good. For most of the summer, disappointing macroeconomic data and profit announcements had battered the stock markets. On 30 August, profit warnings from Sun Microsystems and Corning had brought the Dow below 10,000 for the first time since April. On 7 September, the US employment report had shown a loss in non-farm payrolls of 113,000 jobs, more than double the number expected. Gloom about the European economy had also deepened, with data showing that German industrial production had fallen by 1.5% in July, much more than market participants had anticipated. The price declines from late May to 10 September had amounted to 17% for the S&P 500, 24% for the TOPIX, 16% for the FTSE 100 and 26% for the Dax. Most markets had fallen to their lowest price levels since the 1998 crisis.

... which accelerate after the attacks

The shock of the attacks on 11 September served to compound the conditions of uncertainty. The reactions of stock prices to the events of 11 September were recorded first in markets outside the United States. In European markets, which were still open for afternoon trading, stock prices immediately started to slide (Graph 1.1). When Asian markets opened the next day, prices there also dropped. During the week, the FTSE 100 fell by 5.5%, the Dax by 11.9% and the TOPIX by 2.3%, partly in anticipation of sizeable stock price falls in New York.

When the US equity market reopened for trading on the Monday after the attacks, the S&P 500 index fell by 4.9% on the day, and by 11.6% during the week. The cumulative decline in the MSCI World Index between 10 and 21 September was 12%, amounting to a $3 trillion loss in value for the global market as a whole. Yet these declines were proportionately not as great as those on 19 October 1987, when the US market plunged by more than 20%. Indeed, Asian and European markets quickly recovered some of their losses



Sources: Datastream; national data. Graph 1.1

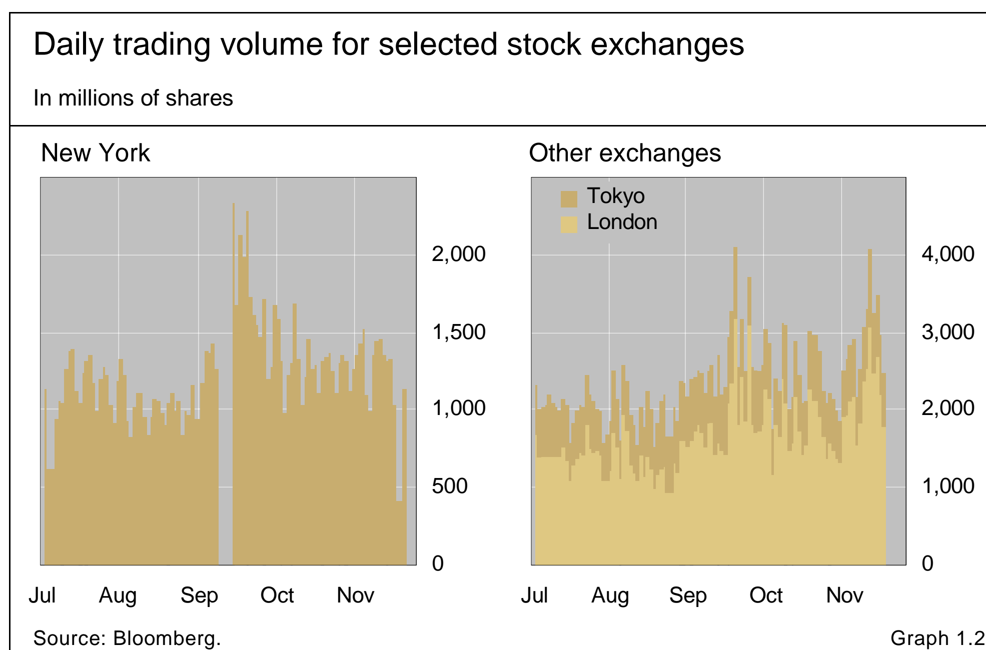
when investors there saw that declines in the US market were not as bad as they had feared.

Markets handle heavy trading volumes successfully ...

The release of selling pressure that had built up during the four days of US market closure gave rise to unprecedented trading volumes when they reopened. However, these did not overwhelm the capacities of the stock exchanges. The New York Stock Exchange in particular saw a record volume of 2.2 billion shares on the first trading day after the attacks, about two and a half times the normal turnover. Trading began to moderate over the next few days but even at the end of September volumes remained at least 25% above their one-year average (Graph 1.2). The trading surge in New York seemed to spill over into European markets, even though they had remained open during the week of the attacks.

To a large extent, the broad declines in stock prices in mid-September were driven by uncertainty about the implications of the attacks for the global economy as a whole. Nonetheless, this general uncertainty did not prevent investors from trying to identify those particular companies whose earnings would be most directly affected. Airline and tourism-related stocks were hit the hardest. Insurance stocks also fell, but subsequently recovered as it became clear that payouts related to the attacks would be spread widely across the industry and that demand for insurance services was likely to increase. Stocks in defence-related industries rallied.

Action by various authorities and investors helped prevent a downward spiral in prices. The Federal Reserve cut its policy rate by 50 basis points early on the morning of 17 September, shortly before the New York markets reopened, and the ECB and other central banks followed suit soon afterwards. In the course of that day and the rest of the week, some institutional investors voluntarily refrained from selling, while analysts held back on issuing downgrades in their stock recommendations. Corporations took advantage of a



relaxation of securities rules to buy back their own stock. Faced with unprecedented net redemptions, US equity mutual funds drew on their cash balances rather than liquidating their stock holdings. Banking and insurance supervisory authorities temporarily adopted looser interpretations of certain rules, for example in cases where institutions might have had to sell large quantities of assets in order to maintain required capital levels.

... and eventually recover much of their losses

A global market recovery began during the last week of September. The rally was sparked in part by market strategists' recommending a return to stocks and in part by expressions of support from an unexpectedly broad coalition of countries for US-led efforts to combat terrorism. The belief that looser monetary policy and a jump in government spending would eventually be effective in stimulating the global economy seemed to take hold. In this context, macroeconomic data often counted for less than news associated with political and military developments. By mid-October, stock markets had recovered nearly all the value that had been lost since the attacks, despite unexpectedly steep falls in employment, consumer confidence and industrial output in several countries. Markets rallied further in November, when more positive economic data emerged and the war effort in Afghanistan began to show results.

Yield curves steepen on expectations of prompt recovery

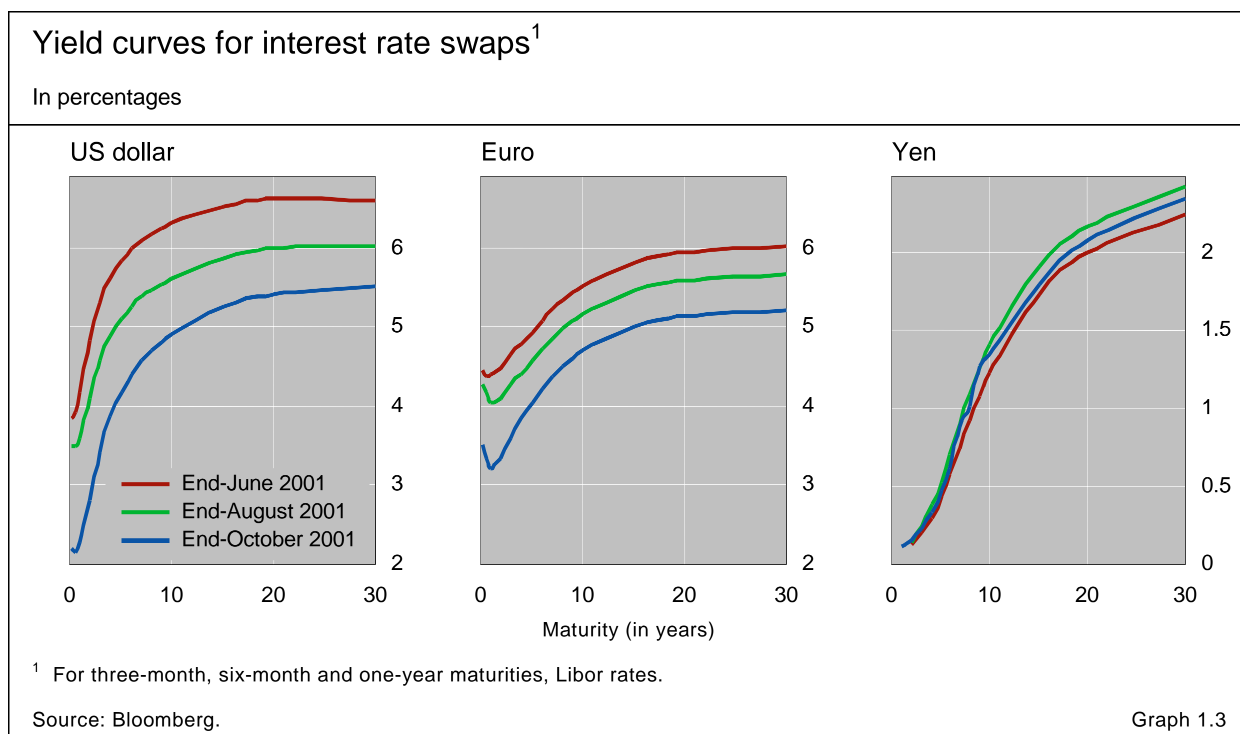
Yield curves steepened in all three of the principal currency areas in the aftermath of 11 September, continuing trends that had begun during the summer (Graph 1.3). In the case of the United States and the euro area, this was the result of declines in short-term rates which were expected to help stimulate the economy. In Japan short-term rates remained close to zero while yields at longer maturity increased slightly to reflect expansionary fiscal policy.

US dollar swap rates fell around 110 basis points at the long end from end-June to end-October, while short rates fell 170 basis points. In response to the rapidly deteriorating growth picture and the absence of inflationary pressures, the Fed cut its target for the federal funds rate by 25 basis points on 27 June and by the same amount on 21 August. In the aftermath of the attacks, it made three further cuts of 50 basis points each, on 17 September, 2 October and 6 November. Trading activity in the US Treasury market was concentrated in the two-year note, traditionally the maturity that is used for making bets on future Fed actions. Movements in two-year yields suggest that, after the Fed's move on 6 November, markets stopped pricing in the expectation of further rate cuts and instead began to anticipate stable or increasing short-term rates.

Steeper US yield curve reflects lower short-term policy rates ...

The prospect of an increased government bond supply hindered these cuts in short-term rates from being fully incorporated into the long end of the yield curve. Markets anticipated a return of government budget deficits, partly as an inevitable result of recession and partly reflecting plans for an aggressive loosening of fiscal policy. This projected increase in the supply of government paper caused investors to demand a relatively higher yield for holding it. As a result, the swap spread narrowed from 80–90 basis points for 10-year obligations before 11 September to 70 basis points afterwards. The steep yield curve also signalled the persistence of investor expectations of an eventual "V-shaped" recovery, though expectations regarding the extent of the downturn continued to grow and the anticipated timing of the recovery continued to be pushed back. At the end of October, the short-term forward curve had built in an expectation that rates would reverse direction in the second quarter of 2002, implying that investors expected signs of a recovery to become apparent by then. The Treasury's announcement on 30 October that it would suspend

... and narrower swap spreads reflect an increase in Treasury supplies



[1] For three-month, six-month and one-year maturities, Libor rates.

Source: Bloomberg. Graph 1.3

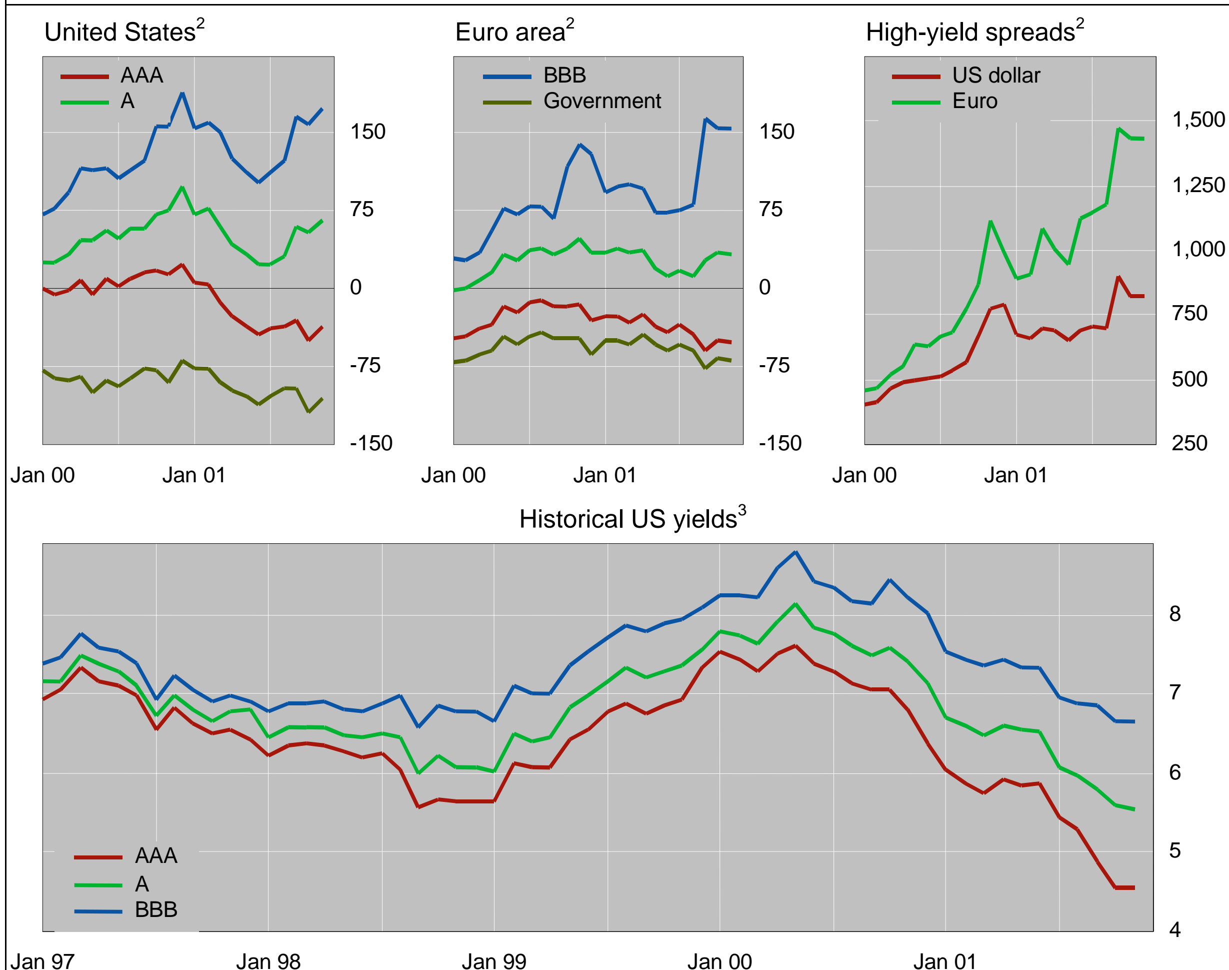
issuance of the 30-year bond increased the scarcity premium on that issue and moderated the steepness of the yield curve somewhat, but did little to alter its overall shape.

Short rates also fall in the euro zone ...

A similar combination of a decline in overall rates and a steepening of the curve took place in the euro zone. The ECB cut its policy rate by 25 basis points on 30 August and by 50 basis points on both 17 September and 8 November. With virtually every new data release contributing to a picture of decelerating growth, rising unemployment and quiescent inflation, forward curves in September and October incorporated market expectations of further cuts over the next few months. Following the ECB's cut in November, these expectations dissipated. As in the United States, markets continued to anticipate a resumption of growth at some point in 2002. In contrast to the United States, however, supply effects did not seem to exert much influence on developments at the longer end of the yield curve.

Corporate and government bond spreads[1]

Month-end data



[1] Bond index yields against 10-year swap rates. [2] In basis points. [3] In percentages.

Sources: Bloomberg; Merrill Lynch; national data. Graph 1.4

In the case of Japan, long-term rates inched higher while short-term rates remained at very low levels. This reflected the continuing bad economic news, and the consequent expectation that fiscal policy would remain expansionary. Markets expected little change in economic conditions in the short and medium term, given the likely fall-off in demand for Japanese exports and the slow progress of the government's plans for restructuring the banking system.

… while Japanese yield curves are largely unchanged

Credit spreads widen but corporate bond issuance bounces back

Reversing a trend that had been in place since January, spreads between yields on lower-rated corporate bonds and swap yields widened steadily throughout the third quarter (Graph 1.4, top panels). This reflected worsening economic news in the United States and Europe and increases in default rates to levels that had not been seen for at least 10 years. While investment grade spreads generally remained narrower than their recent peaks in December 2000, speculative grade spreads widened well past their levels of late 2000, especially in Europe. Most of the increases in investment grade spreads over swaps resulted from declining swap yields, with the corporate yields themselves tending to decline or remain stable (Graph 1.4, bottom panel).

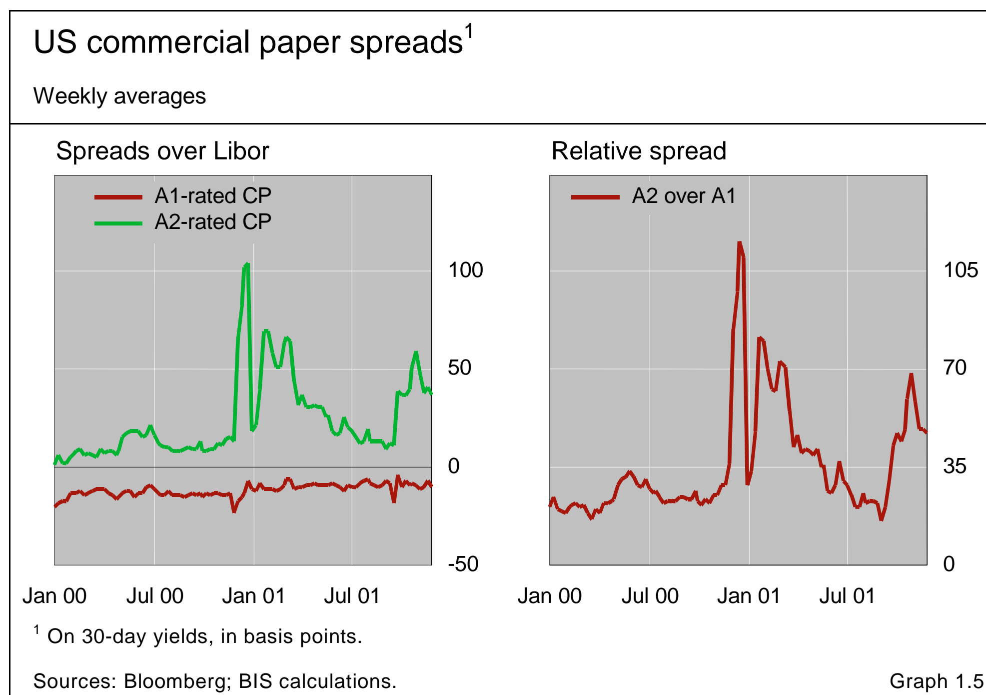
Credit spreads widen in the third quarter ...

Long-term credit spreads continued their widening trend in the days after 11 September. Yield spreads between 10-year triple-B corporates and swaps widened by 8 basis points when markets reopened and by a cumulative 37 basis points up to the end of September. Some observers feared that insurance companies would immediately sell large quantities of corporate bonds to fund payouts related to the disaster, but they did not do so. As with the stock market, the bonds of vulnerable sectors such as airlines were especially hard hit and faced possible downgrades by rating agencies. Credit spreads on commercial paper, which had been turbulent earlier in the year but had since narrowed steadily, jumped sharply after the attacks. They remained high and volatile throughout October following the downgrading of several prominent issuers (Graph 1.5).

... especially after 11 September ...

The post-11 September rise in credit spreads was small relative to that implied by the fall in stock prices. In a parallel fashion, however, spreads did not narrow appreciably when stock prices rallied from late September onwards. By mid-October, markets seemed to be taking the view that, while the economic consequences of the attacks had been such as to compound the existing high level of corporate credit risk, equities still provided an opportunity to benefit from the "upside" of an eventual recovery. In other words, it appears that investors did not lower their overall valuations of corporate assets appreciably, but may have priced in higher levels of uncertainty about those valuations. In some cases, particularly for highly leveraged firms, this higher uncertainty resulted in relatively lower market values for bonds (which are in effect short volatility positions) and higher values for stocks (which benefit from

... though not by as much as falling equity prices would imply



higher volatility).[1]

Most categories of financing flows fall in the third quarter ...

Even before 11 September, the slowing global economy had been contributing to a sharp overall decline in both gross and net debt issuance. In contrast to late 2000 and early 2001, when borrowers had shifted among different financing vehicles in response to market conditions, the third quarter of 2001 witnessed a drop in virtually every category of financing flows. In the international debt securities market, net issuance fell nearly 40%, with almost all of the decline resulting from reduced issuance by the financial and non-financial private sector (see "The international debt securities market" on page 22). The stock of outstanding international money market instruments fell by $46 billion during the quarter, and comparable declines in short-term debt issuance were also witnessed in several domestic markets. Gross amounts raised in the international syndicated loan market also fell sharply (see "International syndicated credits: shift towards higher-rated borrowers" on page 21).

... but investment grade borrowers retain market access

Despite the uncertain conditions prevailing after the attacks, investment grade borrowers generally maintained their access to debt markets. A $5 billion issue by AAA-rated Bristol-Myers Squibb on 25 September signalled the return of investment grade corporate issuance in the international market to more or less normal levels of activity. In October, issuance volumes were reported to be very strong, though some of this reflected the clearance of backlogs. Investors remained eager to absorb investment grade paper, given the poor performance of equity markets and the low yields available on government bonds and short-term instruments. Lower-rated borrowers, however, faced not only higher

---

[1] For a further discussion of this "option-based" theory of bond and equity valuation, see B Cohen, "Credit spreads and equity market volatility", in the November 2000 issue of the *BIS Quarterly Review*.

spreads but also reduced opportunities for issuance. The Japanese domestic corporate bond market was shaken by the default on 14 September of Mycal Corp, a large retailer that had been classed as investment grade by local credit rating agencies.

Rising risk aversion affects emerging markets

Most emerging economies see falling equity prices, rising credit spreads and shrinking debt flows ...

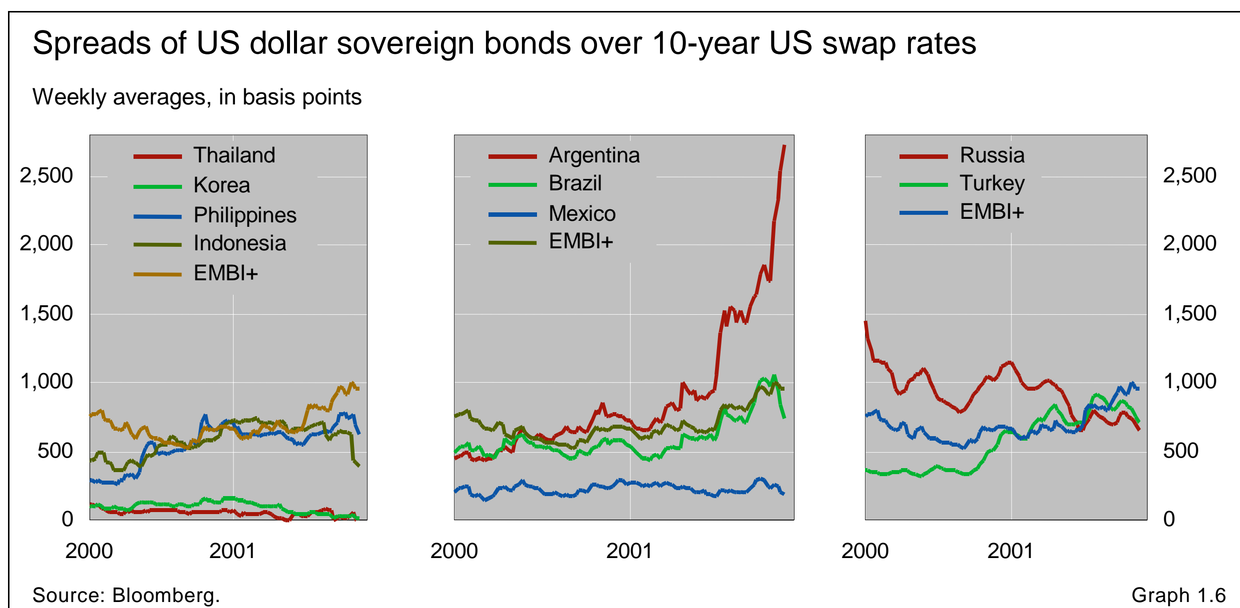
The growing perception of a significant slowdown in economic growth in the industrial world and increased risk aversion among international investors led to falling equity prices and rising credit risk premia in emerging economies (Graph 1.6). Debt issuance by emerging market borrowers declined in the third quarter, while bank lending to these debtors also showed signs of a slowdown (Graph 1.7). In contrast to the previous bout of turmoil in the emerging economies in 1997–98, the scope for an expansion of exports that could replace reduced capital inflows appeared limited. Some borrowers, such as Mexico and the leading eastern European economies, continued to enjoy relatively narrow yield spreads and stable currencies, though their ability to access capital markets in the post-11 September environment has yet to be fully tested. Unlike industrial country market indices, stock prices in the emerging economies generally did not recover fully from their late September lows.

... with attention focused on the problems of Argentina and Turkey ...

Attention continued to be focused on Argentina and Turkey. In early September the IMF increased the size of the lending package available to Argentina by $8 billion, to approximately $22 billion. Of this amount, $3 billion was designated as support for a voluntary rescheduling of Argentina's debt profile. Argentina's problems weighed in turn on investor sentiment towards Brazil, where a significant slowdown in growth, compounded by an energy crisis, contributed to a 28% depreciation of its currency from the start of the year to end-October. Turkey continued to struggle with weaknesses in its

Spreads of US dollar sovereign bonds over 10-year US swap rates

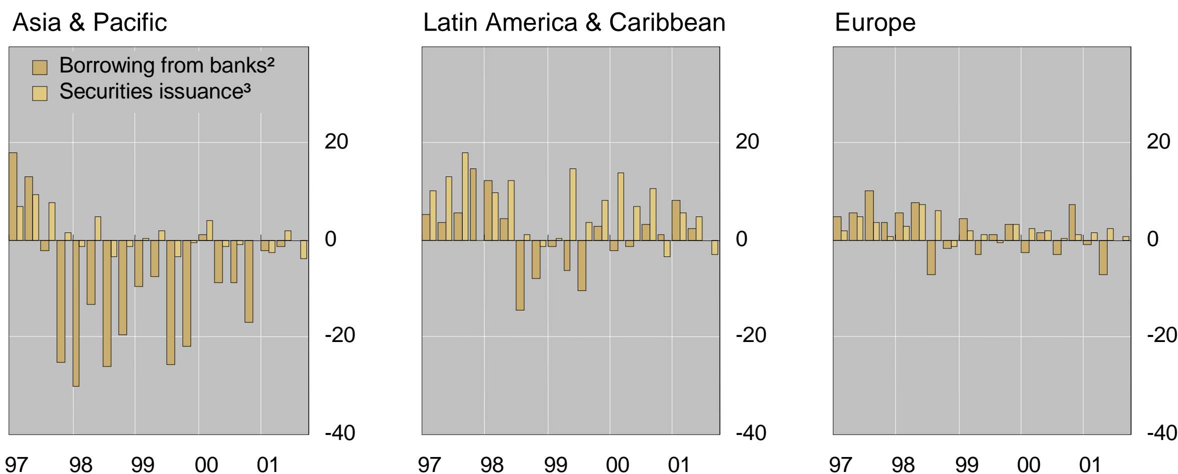
Weekly averages, in basis points



Source: Bloomberg. Graph 1.6

International bank and securities financing in emerging economies[1]

In billions of US dollars



[1] See Annex Table 7A for a list of the countries included in each region. [2] Exchange rate adjusted changes in cross-border loans of BIS reporting banks. Data on bank lending are not yet available for the third quarter of 2001. [3] Net issues of international money market instruments, bonds and notes.

Sources: Bank of England; Dealogic Capital Data; Euroclear; ISMA; Thomson Financial Securities Data; national data; BIS locational banking statistics.

Graph 1.7

banking system, compounded by the likelihood of a substantial decline in real GDP in 2001.

On 1 November, the Argentine government announced plans to restructure its debt by means of an exchange of loans, paying 7% for bonds and other instruments that had offered coupons of 10% or more (and, given the default premium built into Argentine bond prices, an implied yield to maturity far above that). The first phase of the exchange, which closed on 30 November, targeted local investors, who by and large accepted the terms offered. A second phase aimed at international investors is planned. Some international investors regarded the initial announcement of the exchange as a de facto default, and the price of the country's benchmark floating rate bond fell by 6.3% on 1 November. As the debt situation had been widely considered to be unsustainable for some time, this reaction seems unlikely to have resulted from a fundamental re-evaluation of Argentina's creditworthiness. Instead, the price decline may indicate that investors had been hoping for a form of restructuring that would involve more assistance from multilateral institutions.

... though contagion to other emerging markets is limited

Except to a limited degree, these problems did not seem to spread to other emerging markets. Investors had spent several months adjusting their exposures to emerging economies to their desired levels, leaving the risk in the hands of those more willing to wait out the anticipated period of turbulence. Banks had already begun to reduce their exposures to Turkey and Argentina in the first half of 2001, in some cases by using credit risk mitigants such as collateral and guarantees (see "The international banking market" on page 13). As a consequence of this unwinding of positions, spreads on countries perceived to be at risk, and Argentine debt in particular, had already widened

sharply in July. With portfolio flows not having recovered to their 1996–7 levels, the number and influence of global investors with exposures to a broad range of emerging markets was relatively low. In addition, the adoption of more flexible exchange rate regimes by many countries had enabled them to adjust to the external shock of the global slowdown without running up unsustainable current account deficits.

As a result, it appeared unlikely that a further deterioration in the outlook for specific countries would lead to a general "rush for the exits" as in past crises. Indeed, sentiment towards Brazil improved markedly from mid-October onwards, with the real appreciating by approximately 10% against the US dollar between mid-October and the end of November. Sentiment towards Turkey also became more positive, helped by progress on the adoption of a new support package from the IMF.