Jacob Gyntelberg Corrinne Ho Peter Hördahl

jacob.gyntelberg@bis.org *corrinne.ho@bis.org* *peter.hoerdahl@bis.org*

Overview: cautious optimism on gradual recovery

Despite uncertainty about the pace of economic recovery, investors remained cautiously optimistic in the period between end-May and early September 2009. Positive macroeconomic news as well as strong earnings announcements gave market participants hope of a turnaround. Consequently, equity prices rose and credit spreads narrowed. Nevertheless, disappointing data releases at times led investors to doubt their regained optimism, resulting in bouts of volatility. Moreover, bond investors generally appeared somewhat less convinced about the pace of the recovery.

The financial sector continued to report surprisingly strong earnings for the second quarter. Although questions remain about the quality and sustainability of bank profits, the sector outperformed others in both credit and equity markets. Bank credit spreads rallied markedly, nearly reaching the levels prevailing before the Lehman failure, while financial sector equity prices surged by 15–20% in the period.

Generally, markets continued to show signs of normalising, as risk tolerance edged further upwards and risk premia receded. In interbank money markets, key spreads narrowed to levels not seen since the beginning of 2008, and in some cases even further. Improvements were also visible in credit markets, although important segments continued to rely on central bank support.

In this environment, government bond yields were volatile. This reflected the markets' evolving perceptions about both the economic outlook and the future path of monetary policy. Over time, bond investors seemed to increasingly take the view that the worst of the economic downturn was over, but that recovery was likely to be gradual and vulnerable to setbacks. This, in combination with low expected inflation, led them to scale back expectations that monetary polices would begin to normalise anytime soon.

Among emerging markets, the strong growth in some parts of Asia attracted attention. However, concerns over the extent of the credit expansion in China prompted expectations of imminent policy tightening and a reassessment of the country's growth prospects. The ensuing sharp correction in the Chinese equity markets in August exerted a drag on other stock exchanges in the region and at times even on major equity markets.

Bond market investors ponder pace of the recovery

Bond yields fail to rise …

The long-term government bond yields of advanced economies swung widely during the period, as investors reassessed the outlook for macroeconomic conditions as well as for monetary and fiscal policies. In the end, yield movements were mixed in major bond markets. Between end-May and 4 September 2009, the 10-year US bond yield was essentially unchanged, while corresponding euro area and Japanese sovereign yields fell by around 35 and 15 basis points, respectively (Graph 1, left-hand panel). Long-term real yields in the euro area declined in line with nominal yields over the period, while US 10-year real yields rose slightly (Graph 1, centre panel). Meanwhile, the rapid steepening of yield curves that had taken place in the first half of the year tapered off (Graph 1, right-hand panel).

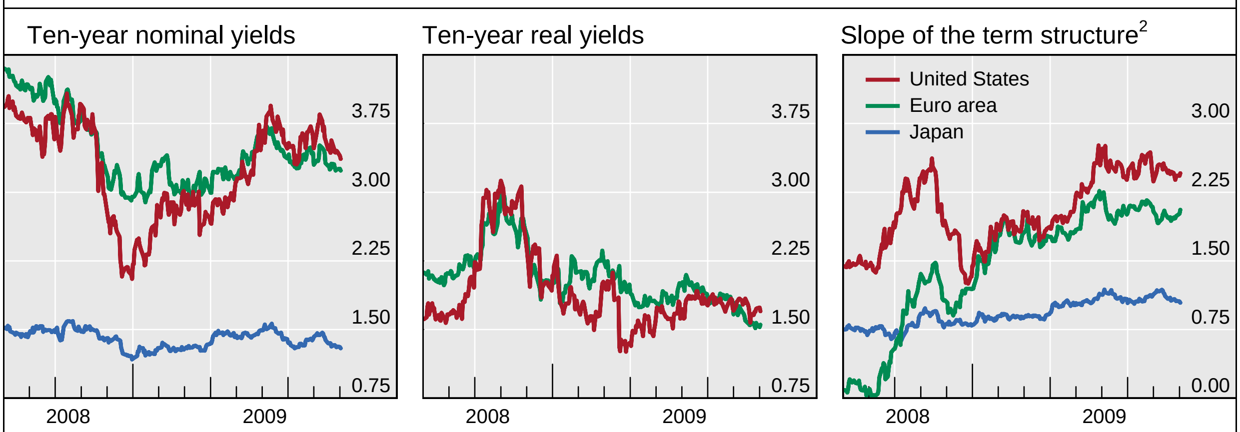
… despite some positive macro news …

Despite the absence of rising yields over the period, economic news generally pointed to recovery or at least to a pronounced slowdown of the rate of deterioration in economic conditions. A case in point was the 5 June US employment report, which showed that non-farm payrolls had fallen by 345,000 (later revised down to 303,000), not only significantly below the 520,000 expected drop but also a smaller decline than in any of the preceding seven months. Meanwhile, in the euro area the German and French economies grew unexpectedly in the second quarter, and the Japanese economy recorded its first quarter of positive growth since Q3 2008, although the rate of growth was lower than expected. In line with this, survey data indicated that expectations for 2010 GDP growth were gradually revised upwards in the United States and the euro area, while for Japan they levelled off (Graph 2, left-hand panel).

… as the recovery is seen to be taking some time

While bond yields tended to rise in response to news indicating economic recovery, from time to time they were pushed back down as disappointing data releases prompted investors both to doubt the strength of the economic recovery and to temporarily reduce their risk tolerance. This was evident on a number of occasions, including in the second half of June into early July and in the second half of August when weak economic data surprised markets (Graph 1, left-hand panel). For example, the US employment report released

Government bond yields[1]

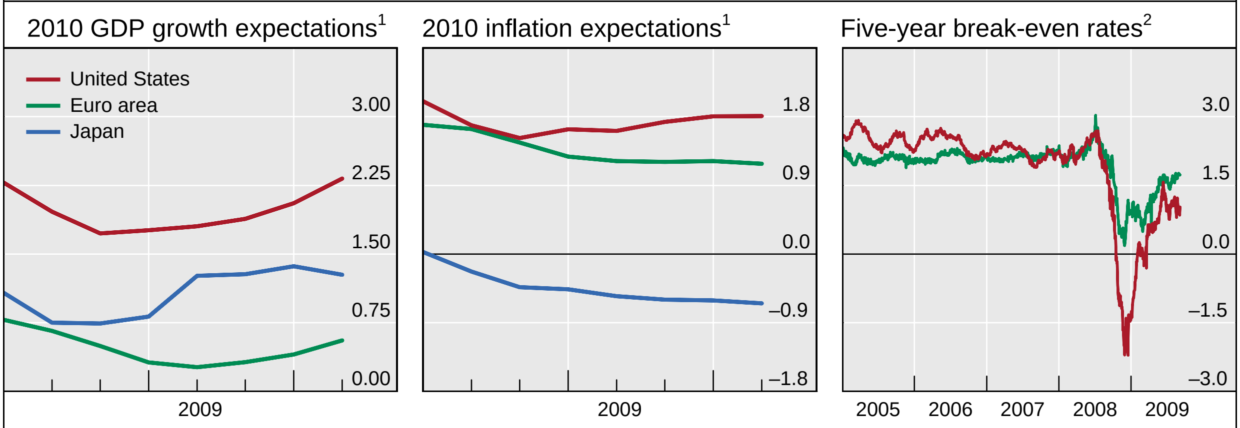


[1] In per cent. [2] Ten-year minus two-year nominal yields.

Sources: Bloomberg; BIS calculations. Graph 1

Macroeconomic expectations and break-even inflation

In per cent



[1] Forecasts published by Consensus Economics; observations are positioned in the month in which the forecast was made. [2] Based on zero coupon real and nominal rates calculated using the Nelson-Siegel-Svensson method on nominal and index-linked government bond prices.

Sources: © Consensus Economics; BIS calculations. Graph 2

on 2 July showed that non-farm payroll employment had declined more than anticipated, and on 14 August there was news that US consumer confidence had retreated. Over time, bond investors seemed to take the view that while the worst of the economic downturn was over, the recovery process would be gradual and vulnerable to negative shocks.

Investors anticipate low levels of inflation …

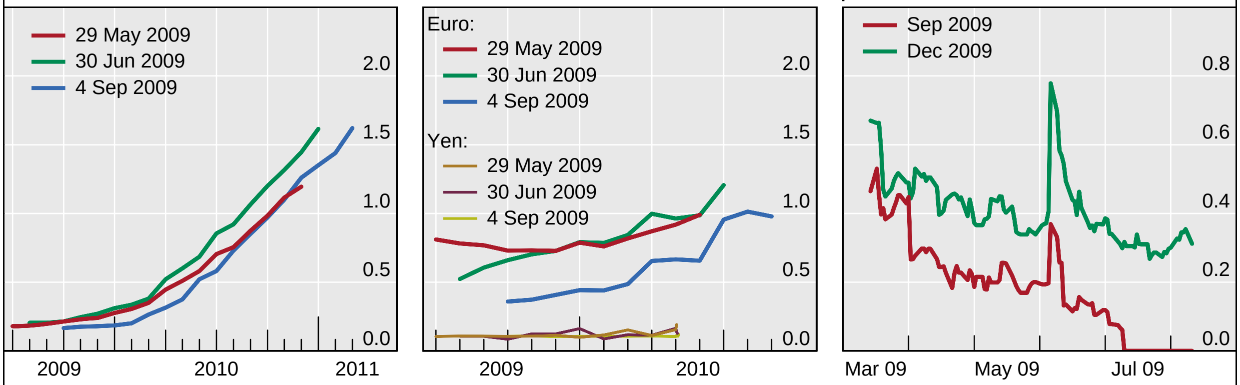
In this environment, survey and bond price data both indicated that near-term inflation expectations remained low in the United States and the euro area. For 2010, survey expectations pointed to inflation levels well below 2% for those two economies (Graph 2, centre panel), consistent with a view that the recovery might be protracted. Medium-term break-even inflation rates hovered at levels somewhat lower than the average in recent years (Graph 2, right-hand panel). With economic growth expected to pick up only gradually, and near-term inflation expectations stable and low, market participants continued to expect extraordinarily low monetary policy interest rates in coming months (Graph 3, left-hand and centre panels).

… and policy interest rates …

Amidst debate about the pace at which this monetary easing should be withdrawn, expectations of an early start to the normalisation process for policy rates were pushed back considerably. In the first few months of 2009, investors had begun to expect that policy rates would be lifted before the end of the year. For example, at the beginning of March 2009, the pricing of options on federal funds futures contracts indicated that the (risk neutral) probability that the Federal Reserve would raise its target above the 0 to 0.25% range by the end of this year exceeded 60%; that of a hike as early as September was around 50% (Graph 3, right-hand panel). The FOMC sought to temper these market expectations by announcing on 18 March 2009 that it expected “exceptionally low levels of the federal funds rate for an extended period”. After that, option-implied probabilities of an early rate hike gradually dropped, with only a temporary reversal in early June following the much better than expected non-farm payrolls release mentioned above.

Monetary policy expectations

Federal funds futures	EONIA and JPY OIS forward rates[1]	Implied Federal Reserve rate hike probabilities[2]



[1] One-month rates implied by overnight index swaps, in per cent. [2] Option-implied probabilities that the Federal Reserve would raise the fed funds target above the 0 to 0.25% range following the FOMC meeting in the indicated month.

Sources: Bloomberg; BIS calculations. Graph 3

… while some central banks prepare to end unconventional policies

Major central banks continued to implement unconventional policies, with the aim of further easing financial conditions in an environment of near zero policy rates. However, while some central banks expanded their unconventional measures, others sought to lay the groundwork for exiting (see box on page 6). In the first category, the Bank of England announced on 6 August that, in order to help steer the rate of inflation back up towards its 2% target, it was expanding the direct purchase of gilts and private sector assets by £50 billion to £175 billion. Meanwhile, citing its view that US economic activity was levelling out, on 12 August the Federal Reserve announced that it would stretch out its announced purchases of Treasury securities up to October before ending the programme.

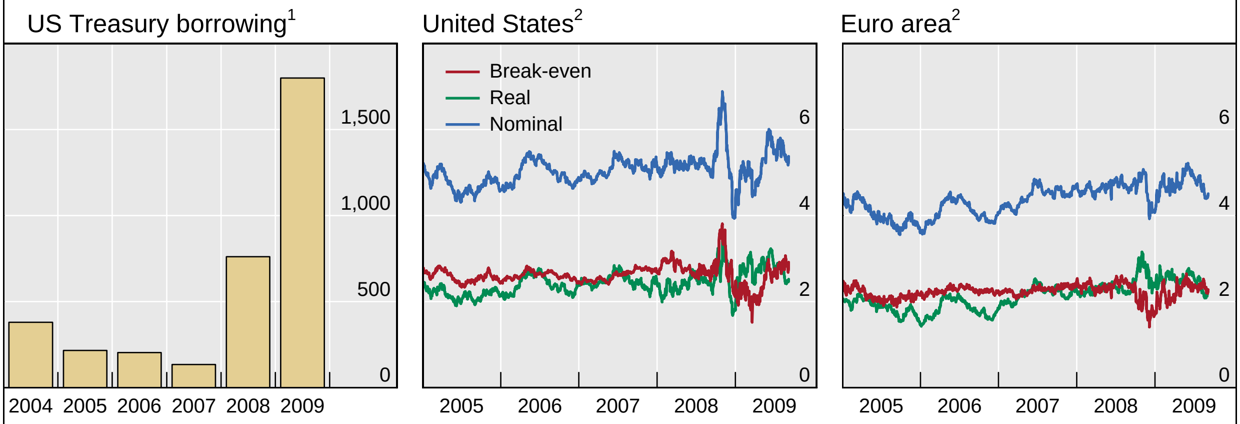
Fiscal deficits remain on investors' minds …

Bond investors continued to weigh the consequences of a growing supply of government debt. This was particularly evident in the case of the United States, where the government was expected to borrow a total of $1.8 trillion dollars, in net terms, in FY 2009 – a 137% increase from the already elevated level in FY 2008 (Graph 4, left-hand panel). Concerns that such a large amount of new government debt would be difficult for markets to absorb, in combination with worries about the sustainability of rapidly growing fiscal deficits, were seen as factors behind the rise in US long-term yields that took place in the first half of the year.

… but worries seem to have eased

However, more recently the upward pressure on yields resulting from such worries seems to have abated considerably, as indicated by a recent decline in five-year forward rates five years ahead. Fiscal sustainability concerns are likely to affect forward yields that span distant horizons, which are less influenced by near-term expectations about inflation, economic growth and monetary policy. In particular, rising concerns about the fiscal outlook could be expected to put upward pressure on *real* forward rates. Since end-May, however, both real and nominal five-year/five-year forward rates have dropped in the United States as well as in the euro area (Graph 4, centre and right-hand panels).

US government borrowing and implied five-year-ahead five-year forward rates

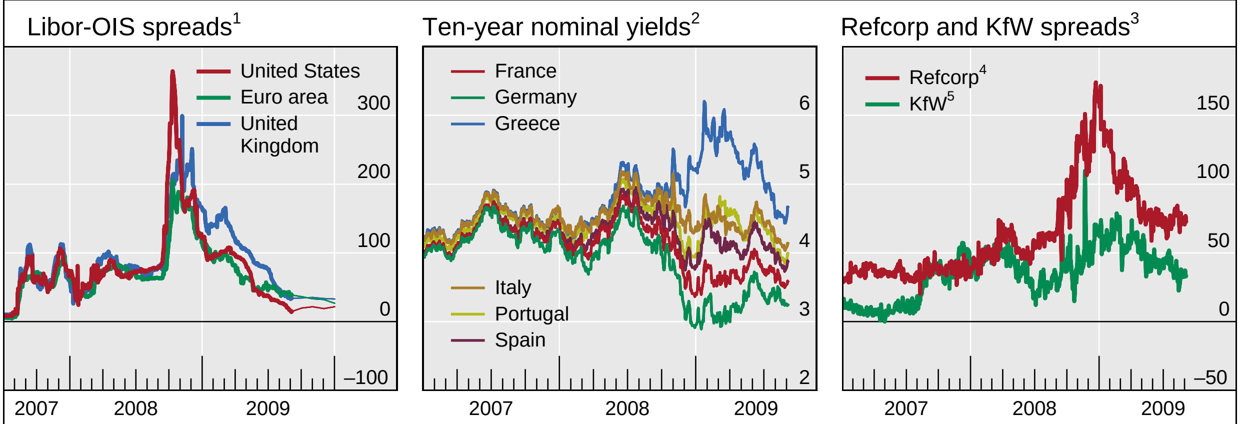


[1] Marketable borrowing in billions of US dollars. The years on the horizontal axis refer to fiscal years (October–September), and the value for 2009 includes a forecast for the fourth fiscal quarter by the US Treasury's Office of Debt Management. [2] Based on zero coupon real and nominal rates calculated using the Nelson-Siegel-Svensson method on nominal and index-linked government bond prices, in per cent.

Sources: Bloomberg; US Treasury's Office of Debt Management; BIS calculations. Graph 4

The possible inflationary repercussions of ongoing fiscal and monetary policies continued to be in focus throughout the period. Nonetheless, five-year forward break-even rates five years ahead were little changed over the period from end-May to 4 September (Graph 4, centre and right-hand panels). Long-term inflationary pressures therefore appear contained for now, despite surging fiscal deficits and record-low monetary policy rates. This may reflect the belief that the current high level of economic slack will persist for some time.

Yields and interest rate spreads



[1] Three-month Libor rates minus corresponding overnight index swap (OIS) rates (for the euro area, EONIA swap), in basis points. Thin lines show forward spreads, calculated as the difference between three-month forward rate agreement (FRA) rates and corresponding implied OIS rates, as at 4 September 2009. [2] Government bonds, in per cent. [3] Based on zero coupon rates, in basis points. [4] Ten-year zero coupon spread between yields on bonds issued by Refcorp (Resolution Funding Corporation, a US Treasury agency created in order to help resolve the savings and loan failures and whose debt is guaranteed by the US government) and US Treasury bonds. [5] Ten-year zero coupon spread between yields on bonds issued by KfW (a bank owned by the Federal Republic of Germany and the federal states and whose debt is guaranteed by the Federal Republic of Germany) and German government bonds.

Sources: Bloomberg; BIS calculations. Graph 5

Exiting from balance sheet policy of central banks

Robert N McCauley

With market conditions improving, discussion has turned to when, and how, central banks will tighten monetary policy and whether this will involve a disposal of the assets accumulated during the crisis to keep markets functioning and to affect asset prices ("balance sheet policy"). In principle, these decisions can be taken independently. As the BIS *79th Annual Report*, Chapter VI, points out, central banks can raise policy rates and reduce excess reserves without shrinking their balance sheets, provided they have an adequate set of tools at their disposal.

This box focuses on the factors conditioning the sequence of these two decisions. The two extreme cases are: working down the balance sheet and only then raising interest rates; and raising interest rates without shrinking the balance sheet. These cases can be represented as a move left then up, or a move straight up in the graph of balance sheet size (indexed to 100 at the highwater of balance sheet policy on the x-axis) and interest rate (starting at zero on the y-axis). It should be recognised that asset reductions carry different implications (and changes in composition of assets as well as their size can be important).

At one extreme, the Bank of Japan (BoJ) in 2006 shrank its balance sheet before it raised policy interest rates. Without the authority to pay interest on excess reserves, the BoJ stopped replacing maturing assets in the months after March 2006.[1] "Current accounts", or bank reserves, fell from ¥31 trillion at end-March 2006 to about ¥10 trillion by mid-June and total BoJ assets fell even more, from ¥145 trillion to ¥113 trillion on 20 June. This balance sheet reduction, along with the reopening of interbank credit lines and the introduction of trading in forward overnight interest rates, prepared market participants for the July rise in the short-term interest rate. Graph A shows a leftward move along the x-axis at zero interest rates, and then a return to positive interest rates. Running off assets in this manner depended on careful limits on long-term bond holdings,[2] and on the term of money operations. Interestingly, the BoJ continued, after this exit from excess reserves and return to positive interest rates, to buy bonds every month.

The BoJ's focus on its liabilities may limit the force of this precedent for how to exit from a low-interest high-asset situation. In the Japanese case, which assets were acquired to support central bank liabilities was portrayed as incidental and the choice of short-term assets permitted a rapid but passive run-down. The Bank of England and the Federal Reserve, purchasing bonds in order to lower long-term rates, and the Swiss National Bank, purchasing foreign exchange to hold down the Swiss franc, find themselves in different positions from the BoJ.

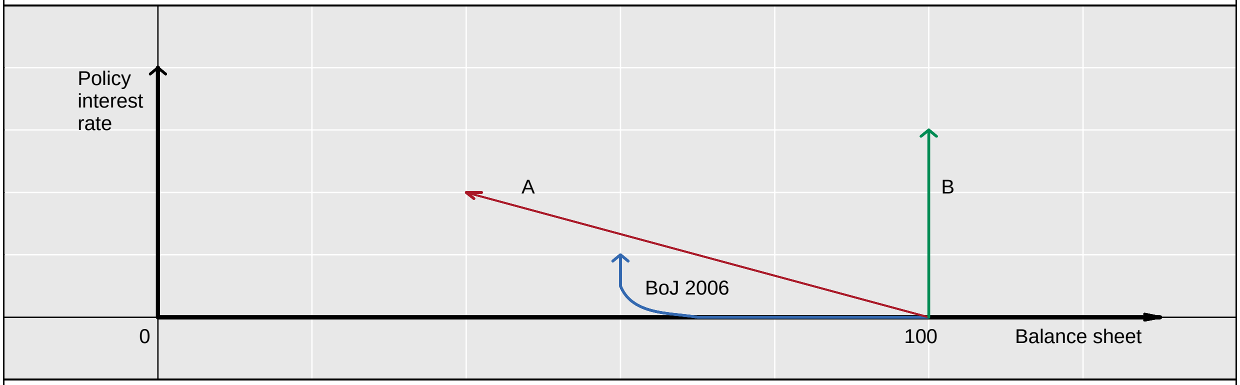
In these cases, various considerations will bear on the choice of exit path, including market functioning, prices and reaction, as well as the run-off of any short-term assets. Somewhat overlooked, different concepts of balance sheet policy – stock versus flow – may also condition the path chosen. On a stock view, monetary stimulus is seen as arising from the central bank's *holding* of assets like government or other bonds. On a flow view, monetary stimulus arises from the central bank's *purchase* of assets. From this perspective, stimulus ends when no more purchases are announced and asymmetry may be desired: maximum effect in buying and "neutrality" in selling.

This distinction could become important when the time comes to tighten policy. On the stock interpretation, to raise the short-term interest rate while never selling the bond holdings would be to tap the brake while the other foot remained firmly on the accelerator. On the flow interpretation, without a foot on the accelerator, one could consistently tap the brake. Thus, the stock concept would be consistent with a tightening path like vector A in the graph (or even a path like that of the BoJ), while the flow concept would permit a tightening path like vector B in the graph.

The Bank of England's policies have arguably been based on the stock view of balance sheet policy. In particular, its rationale for gilt purchases to reach an eighth of GDP included the quantity of broad money. The Bank of England has made clear that when the inflation target requires a withdrawal of monetary stimulus, it would have two tools: hikes in the policy rate and asset sales. Sales of Bank of England bills could absorb liquidity, "allowing us to stagger the sales of the gilts".[3] In response, market analysts are couching their forecasts of policy in terms of both rises in the short-term interest rate and gilt sales.

In contrast, statements from the Federal Reserve tend to view the monetary stimulus arising from its $1.75 trillion in bond purchases mainly in flow terms. Looking forward, the difficulty of calibrating the restraining effect of bond sales in view, inter alia, of financial firms' evolving balance

Stylised exits from balance sheet policies at low policy rates



Source: Author's calculation. Graph A

sheet constraints and risk appetite may argue against bond sales. That said, the Federal Reserve has signalled that it will not necessarily exit along a vertical vector like B. Able (like the Bank of England) to pay interest on excess reserves, the Federal Reserve *could* quit purchasing bonds and raise interest rates without shrinking its assets.[4] Or excess reserves *could* be absorbed without asset sales through short-term repo transactions against long-term securities or an extension of the Treasury's selling bills in excess of its borrowing requirements and depositing the proceeds with the Federal Reserve. Among the options listed, albeit mentioned last, were bond sales.

The Swiss National Bank has offered little guidance on its exit from its policy of purchases of foreign assets to resist currency appreciation. Conceptually, some recent studies of foreign exchange intervention focus on the effect on order flows, while the portfolio balance approach emphasises the relative size of stocks. Behaviourally, there are instances where central banks have reduced official foreign exchange reserve holdings after a series of purchases, but more cases like that of Japan since 2004, in which holdings remain at levels reached as a result of intervention. Recent experience in borrowing dollars from both the Federal Reserve and the market will factor in any reconsideration of the appropriate level of Swiss foreign exchange reserves.

In addition to the above factors, political economy considerations may also condition the exit path chosen. The Bank of England's asset purchases were capped ex ante by an exchange of letters with the UK Treasury, held in a special account and supported by a government indemnity against losses should interest rates rise. These arrangements allow the Bank of England to sell gilts without loss to its own limited equity so that these considerations might not be relevant. With less formal coordination of its asset purchases with the US Treasury, either as recipient of its profits or as debt manager, these considerations may be relevant for the Federal Reserve.

---

[1] Alternatively, the BoJ could have issued central bank bills to mop up liquidity, thus exchanging two types of liabilities while leaving assets unchanged. [2] Bank of Japan, Financial Markets Department, "Money market operations in fiscal 2006", *BoJ Reports and Research Papers*, July 2007; on bond purchases, "Government debt management at low interest rates", *Quarterly Review*, June 2009. [3] Deputy Governor Bean speech at Cutlers' Feast, Cutlers' Hall, Sheffield, 21 May 2009. On 21 July 2009, Bean was quoted as follows in the Nottingham *Evening Post*: "It is quite likely we will in the first instance raise bank rate. We can then start selling the assets we have bought at a rate which recognizes the market circumstances at the time." [4] "Monetary policy as the economy recovers", in Board of Governors of the Federal Reserve System, 2009, *Monetary Policy Report to the Congress* (Washington: Board of Governors, July), pp 34–7.

Conditions in money markets normalise further

Money markets continued to show signs of normalising, a process set in motion earlier in the year. In interbank money markets, spreads between three-month Libor rates and corresponding OIS rates fell to levels not seen since January 2008. In the case of US rates, the spread dropped to the lowest level since the outbreak of the financial crisis in mid-2007 (Graph 5, left-hand panel). Signs of receding liquidity premia and rebounding risk tolerance were also evident in bond markets. Yields on euro area government bonds continued to converge (Graph 5, centre panel). Moreover, spreads between yields on government-guaranteed bonds and sovereign bonds narrowed further (Graph 5, right-hand panel).

Equity markets push higher despite bouts of volatility

Major equity markets rise to new highs for the year …

Major equity markets continued to recover. While better than expected economic data and corporate earnings helped to lift benchmark indices to new highs for the year, trading conditions were at times volatile as market participants reassessed the pace of economic recovery and the prospects of earnings growth. Between end-May and 4 September 2009, the S&P 500 index rose by 11%, reaching its highest levels since early October 2008. The Dow Jones EURO STOXX index advanced by 12%, while the FTSE 100 rose by 10% during the same period. The Nikkei 225 index, which had tended to outperform other major indices until mid-August, failed to keep pace subsequently and ended the period up 7% (Graph 6, left-hand and centre panels).

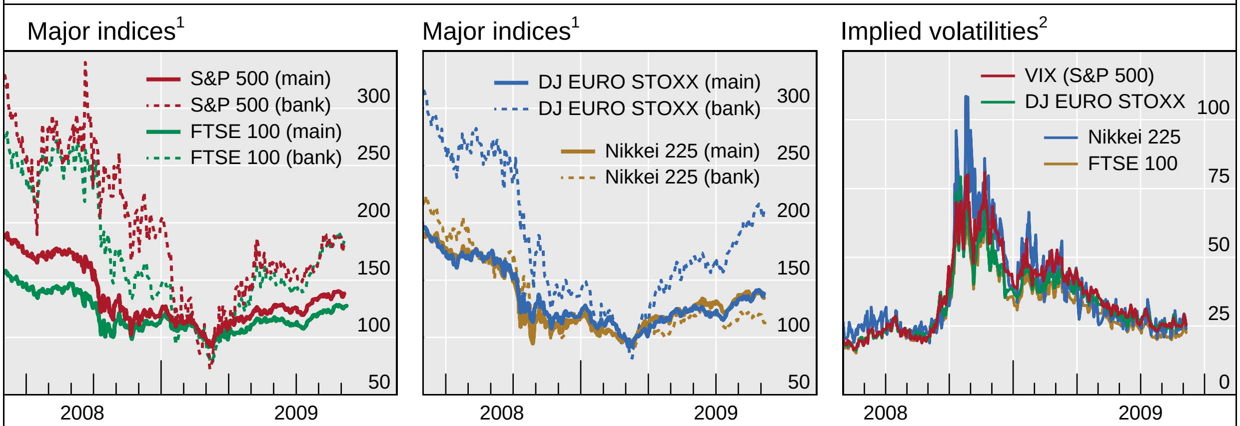
… but remain susceptible to doubts over economic recovery

Although gradual improvements in the global economic outlook set a positive tone for equities, market participants remained sensitive to any indications to the contrary. In June and early July, major equity markets saw outsized one-day declines on days with news or data releases that cast doubt on the prospects of a sustained recovery. By the second week of July, major equity indices had retreated to their lowest levels since late April. Investors' caution ceded to the flow of positive corporate earnings news between mid-July and early August, only to return in mid-August ahead of major central bank policy decisions. Moreover, major equity markets appeared to be more affected than usual by news on the Chinese economy (see emerging markets section below), further underscoring market participants' concern over the strength of economic recovery.

Financial sector shares rally on strong second quarter results

Periods of uncertainty notwithstanding, equity markets rallied between mid-July and early August on the back of mostly positive second quarter corporate earnings reports, which mirrored the ongoing upward revision of

Equity market prices and implied volatilities



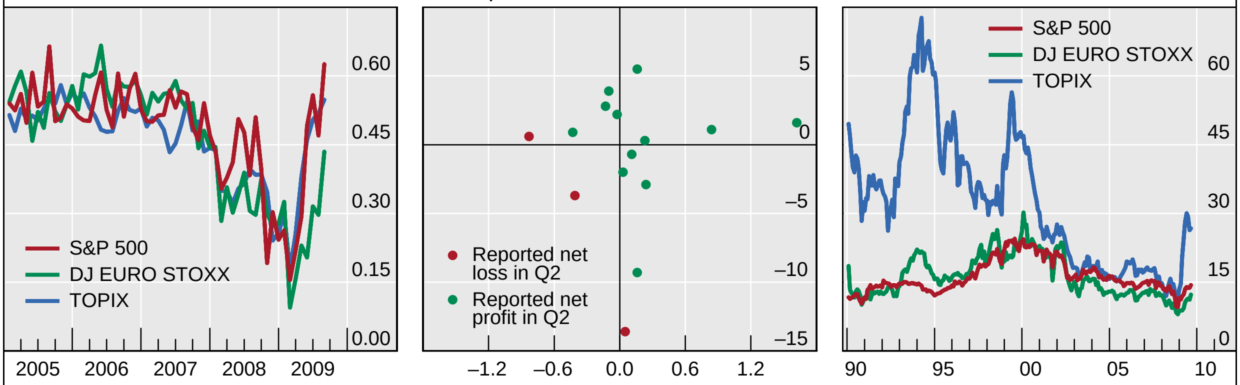
[1] In local currency; 1 March 2009 = 100. [2] Volatility implied by the price of at-the-money call option contracts on stock market indices, in per cent.

Sources: Bloomberg; BIS calculations.

Graph 6

Earnings, equity prices and price/earnings ratios

Earnings revisions[1] | Banks' earnings surprises and stock price reactions[2] | Price/earnings ratios[3]



[1] Diffusion index of monthly revisions in forecast earnings per share, calculated as the percentage of companies for which analysts revised their earnings forecast upwards plus half of the percentage of companies for which analysts left their forecast unchanged. [2] X-axis = actual basic earnings per share minus consensus estimate prior to announcement (in US dollars); y-axis = change in bank's stock price on the day of announcement minus change in financial sector index (in percentage points). Sample covers 15 large banks that reported earnings between 14 July and 7 August 2009. [3] Based on consensus forecasts for one-year operating earnings.

Sources: Bloomberg; I/B/E/S; company reports; BIS calculations. Graph 7

earnings expectations (Graph 7, left-hand panel). Market participants welcomed, in particular, the fact that a number of major financial institutions were able to deliver a second consecutive quarter of strong earnings while some others, after having been in the red for several quarters, finally returned to profit. Against this backdrop, the S&P 500 financial sector sub-index rose by 16% between end-May and 4 September, recovering all losses since November 2008, though still some 30% down from its mid-2008 levels. Financial sector shares in the United Kingdom and on other European exchanges rallied by over 20% during the same period, while those in Japan advanced by a smaller degree. The financial sector, which had led the market down earlier this year, has continued to lead the market up since the turnaround in early March (Graph 6, left-hand and centre panels). This pattern stands in contrast to the one observed earlier this decade, when bank stocks traded as if bank earnings were relatively stable (see the special feature by King in this issue).

Signs of loan quality deterioration worry market participants …

However, instances of negative market reactions to positive headline results suggest that there were questions about the quality and sustainability of banks' profitability (Graph 7, centre panel). For example, despite a better than expected second quarter net income of €1.1 billion, Deutsche Bank's share price declined sharply (by 11%) on 28 July, underperforming that of other European banks, as the doubling of loan loss provisions over the preceding quarter to €1 billion caught market participants' attention. Likewise, despite reporting a rise in net income to $3.17 billion on 22 July, Wells Fargo also underperformed its peers, as investors took notice of the increase in problem loans and other non-performing assets. To be sure, a number of major financial institutions were still reporting losses (eg Morgan Stanley, Mizuho Financial Group, UBS, RBS), and their share prices tended to underperform on the day the results were announced.

Market participants interpreted headline results with caution for a number of reasons. First, banks' reported earnings in the past two quarters have been unusually influenced by a host of one-off or technical factors (eg gains or losses from asset sales, fair value changes resulting from fluctuations in the spreads on banks' own debt), which do not relate to underlying profitability. Second, the rebound in earnings of some banks has been driven by a surge in underwriting fees and trading revenue. Such a surge may prove transient, since the extraordinary environment that helped push up non-interest income in the first half of this year may not persist as market conditions normalise. Third, it is not always clear whether to interpret the rise in loan loss provisions as only a temporary drag on net income reflecting precaution, or as an indication of more loan losses to come.

… as do other caveats in the sources of bank profits

The overall improvements in equity market conditions, as reflected in the recovery of price/forward-earnings ratios from multi-decade lows (Graph 7, right-hand panel), helped financial institutions regain access to market funding and reduce the need for government assistance. In June, after demonstrating their ability to raise funds in the market unassisted, 10 large US financial firms were granted permission to repay a combined $68 billion of preferred shares issued to the government under the Capital Purchase Program. A number of these firms also subsequently redeemed the warrants attached to share purchase, thereby formally relieving themselves of the costs and non-price conditions of the programme. Similarly, non-US banks increasingly returned to the market, with some also seeking to reduce their dependence on government support.

Improved market conditions allow some banks to reduce reliance on government support

The continued recovery of major equity markets was accompanied by a general decline in volatility (Graph 6, right-hand panel). For example, the VIX, which had hovered around 32 in late May, eventually traded down towards 25 in August, the lowest levels since the eve of the Lehman bankruptcy in mid-September 2008.

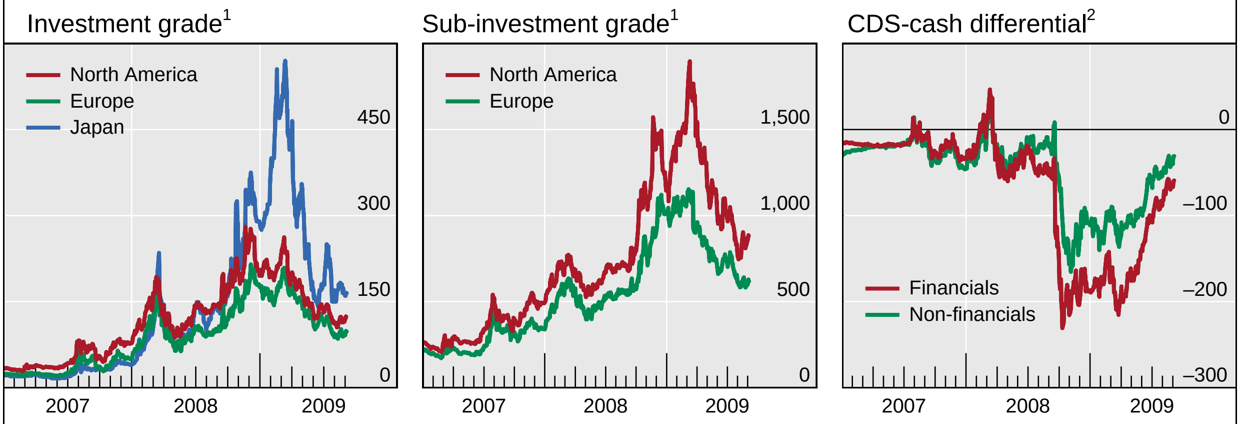
Credit markets continue to improve

Credit markets continued to improve over the last few months. Credit spreads tightened and corporate bond issuance remained high amid initial recovery signs and positive earnings news from a number of major financial institutions. Nevertheless, spreads were still elevated and important market segments, such as those for asset-backed securities (ABS) and commercial mortgage-backed securities (CMBS), remained subdued, prompting further policy actions to support these markets.

Further improvements in global credit markets

Improved market conditions were reflected in declining credit spreads, particularly for lower-rated borrowers. By early September, spreads on US and European investment grade debt had tightened by around 25 basis points from late May (Graph 8, left-hand panel). In Japan, spreads on investment grade bonds fluctuated widely over the period, reflecting mixed economic data. In contrast to the moderate declines in investment grade spreads, sub-investment grade spreads tightened substantially during the period. European and US sub-investment grade spreads narrowed by around 119 and 200 basis points,

Credit spread and CDS-cash basis indices



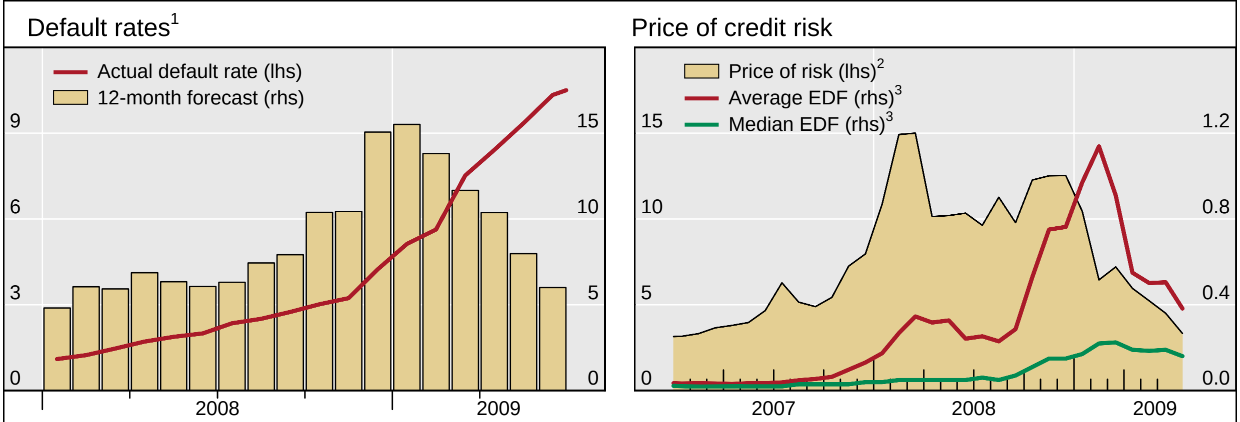
[1] Five-year on-the-run CDS mid-spread on index contracts of investment grade (CDX North America; iTraxx Europe; iTraxx Japan) and sub-investment grade (CDX High Yield; iTraxx Crossover) quality, in basis points. [2] CDS-cash measures, approximated by the difference between the iTraxx Europe (non-) financials five-year on-the-run CDS mid-spread and the iBoxx (non-) financials cash market spread.

Sources: Bloomberg; JPMorgan Chase; BIS calculations. Graph 8

respectively, reaching levels well below the highs recorded in March (Graph 8, centre panel). The gradual improvement in credit conditions was also reflected in the so-called CDS-cash basis, ie the difference between CDS premia and par asset swap spreads for the corresponding cash market bonds, which continued to tighten over the period, although it remained in negative territory (Graph 8, right-hand panel). This suggests that credit market dysfunctions are slowly disappearing, but are not yet gone.

Overall shrinking credit spreads also reflected improvements in the outlook for defaults (Graph 9, left-hand panel). Actual default rates continued to rise, but market forecasts of future default rates declined further, supported by early signs of economic recovery and positive earnings data. The growing

Default rates and price of credit risk



[1] Moody's global 12-month issuer-weighted speculative grade default rates for 2008–09; forecasts refer to the 12-month period starting at the reporting date. [2] 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. [3] In per cent.

Sources: JPMorgan Chase; Markit; BIS calculations. Graph 9 optimism was also reflected in the further recovery of indicators of risk tolerance. The price of credit risk, calculated as the ratio of credit spread-implied (risk neutral) to empirical default probabilities of investment grade issuers, declined over the third quarter (Graph 9, right-hand panel).

Financial sector spreads rally on earnings and early recovery signs

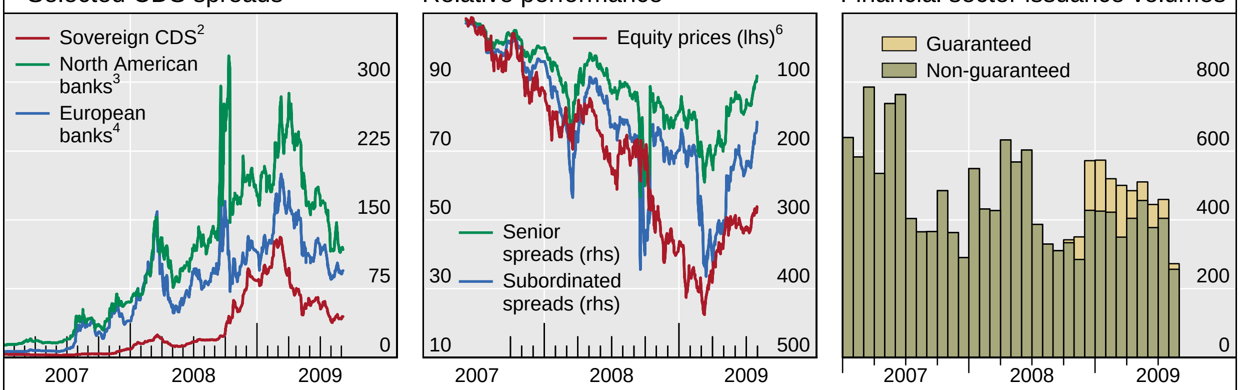
Financial sector credit spreads, particularly those on the subordinated debt of major banks, tightened substantially from mid-July (Graph 10, left-hand and centre panels). Nevertheless, the prospect of low economic growth and its negative impact on the sustainability of banks' profitability did lead to a widening of spreads for banks from June until mid-July (Graph 10, left-hand panel). The still less than robust financial health of banks was reflected in the continued tightening of lending standards. In addition, despite moderate financial sector bond issuance, banks continued to rely in part on government-guaranteed funding (Graph 10, right-hand panel).

Corporate bond issuance remains high

The ongoing improvement in credit market conditions was also reflected in the rate of global corporate bond issuance, which remained high throughout the period (Graph 11, left-hand panel). The high volumes of non-financial issuance in the major currencies coincided with banks' continued efforts to deleverage and improve their balance sheets.

The US mortgage and securitisation markets continued to benefit from government support (Graph 11, centre panel). Agency mortgage-backed spreads declined further over the period – a continuation of a downward trend which began last November following the Federal Reserve's announcement of plans to purchase agency securities. Increased refinancing by borrowers into lower rate agency loans resulted in a temporary rise of 30-year conventional mortgage rates at the end of June. These refinancing activities also led to an increase of \$100 billion in the total volume of outstanding MBS from the first to the second quarter. Meanwhile, as a consequence, outstanding agency MBS volumes grew by over \$200 billion over the second quarter of the year, while non-agency MBS volumes declined by more than \$100 billion.

Financial sector indicators



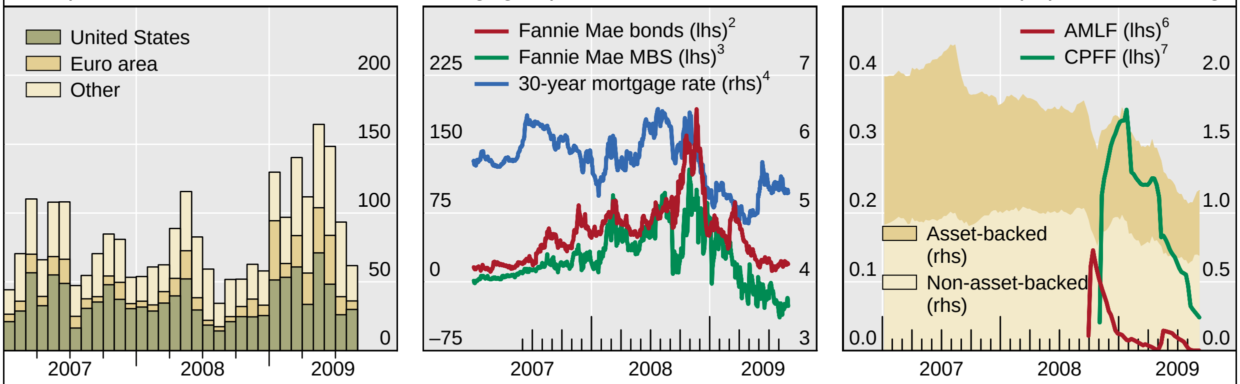
[1] Equally weighted average senior CDS spreads, in basis points. [2] Five-year for France, Germany, Japan, the United Kingdom and the United States. [3] Eleven banks headquartered in North America. [4] Twelve banks headquartered in Europe. [5] Equity prices (in US dollars, equally weighted average) and spread data (equally weighted average, inverted scale, in basis points) are for the universal banks in the left-hand panel for which both subordinated and senior spreads are available. [6] 1 August 2007 = 100. [7] Syndicated international and domestic debt securities placed by financial issuers, in billions of US dollars.

Sources: Bloomberg; Datastream; Markit; BIS calculations.

Graph 10

Global corporate bond issuance, US mortgage and commercial paper markets

Corporate bond issuance[1] | Mortgage spreads and rates | US commercial paper outstanding[5]



[1] Syndicated international and domestic debt securities placed by non-financial private issuers, in billions of US dollars. [2] JPMorgan index; two-year on-the-run spread to Treasuries, in basis points. [3] JPMorgan index; option-adjusted spreads over Libor, in basis points. [4] Fixed rate conventional; national average, in per cent. [5] In trillions of US dollars. [6] Asset–backed Commercial Paper Money Market Mutual Fund Liquidity Facility. [7] Net portfolio holdings of Commercial Paper Funding Facility.

Sources: Federal Reserve Bank of New York; Bloomberg; Dealogic; JPMorgan Chase. Graph 11

ABS and CMBS markets remain weak …

While policy actions helped US mortgage bond markets, other parts of US credit markets continued to reflect the weak financial situation. Markets for ABS backed by consumer and business loans and for CMBS were most clearly affected. In response, the Federal Reserve and the US Treasury in mid-August extended the Term Asset-Backed Securities Loan Facility (TALF) until 31 March 2010 for newly issued ABS and existing CMBS, while it was extended until 30 June 2010 for newly issued CMBS.

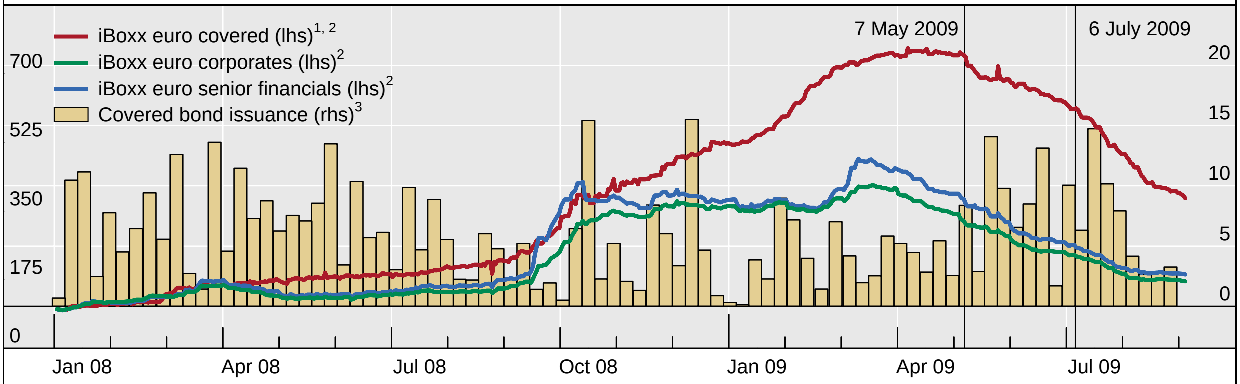
… while CP market shows early signs of recovery

Although weakness remained in the US commercial paper (CP) market, there were early signs of improvement. Up to mid-August, amounts outstanding fell to $1 trillion before they began to increase again, reaching $1.16 trillion by early September (Graph 11, right-hand panel). The lower rate of CP issuance, together with the high corporate bond issuance, point to a significant decline in short-term corporate funding. The recovery in the CP market was also reflected in the outstanding balances in the Federal Reserve's programmes targeting this market. The size of the Commercial Paper Funding Facility (CPFF) programme, which supports longer-maturity (90 days plus) CP, fell substantially from about $160 billion in late May to $48 billion by early September. The Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) declined to just $79 million by early September, after having reached almost $29 billion in early May.

ECB support programme …

The euro area credit markets were affected by policies aimed at supporting mortgages and covered bonds. On 6 July, the ECB and the 16 national central banks of the euro area launched the Eurosystem covered bond purchase programme, which had been announced on 7 May. This programme provides for the purchase of covered bonds, with a targeted nominal amount of €60 billion. In the period from 6 July 2009 to early September 2009, covered bonds with a total nominal value of about €10 billion were purchased under the programme, corresponding to slightly less than 20% of total issuance over the same period.

Eurosystem covered bond purchase programme



[1] Covered bond spread between the yield of a covered bond and the rates quoted for euro interest rate swap contracts. [2] 2 January 2009 = 100; spread as index. [3] Syndicated debt securities placed in domestic and international markets; announced covered bond issuance by euro area residents, in billions of US dollars; weekly.

Sources: Bloomberg; Dealogic. Graph 12

... helps increase covered bond issuance

The programme influenced both credit spreads and issuance volumes in the European covered bond market. Since it was announced, covered bond spreads have narrowed significantly (Graph 12). The programme also appears to have helped revitalise the primary market for covered bonds. Primary market issuance, which had remained low since September 2008, increased visibly in May after the programme's announcement. In addition, borrowers have been able to issue at the lower end of the indicative spreads announced during the pre-marketing period, with many new bonds being oversubscribed. Since the launch of the programme, a number of covered bonds have been issued in the Spanish, French and German markets, as well as in Portugal, the Netherlands and Italy, where covered bond issuance has historically been limited. Furthermore, several bonds from institutions that have not previously issued covered bonds have been purchased under the programme.

Chinese equity correction reverberates in other markets

Revived risk tolerance continues to support emerging market assets

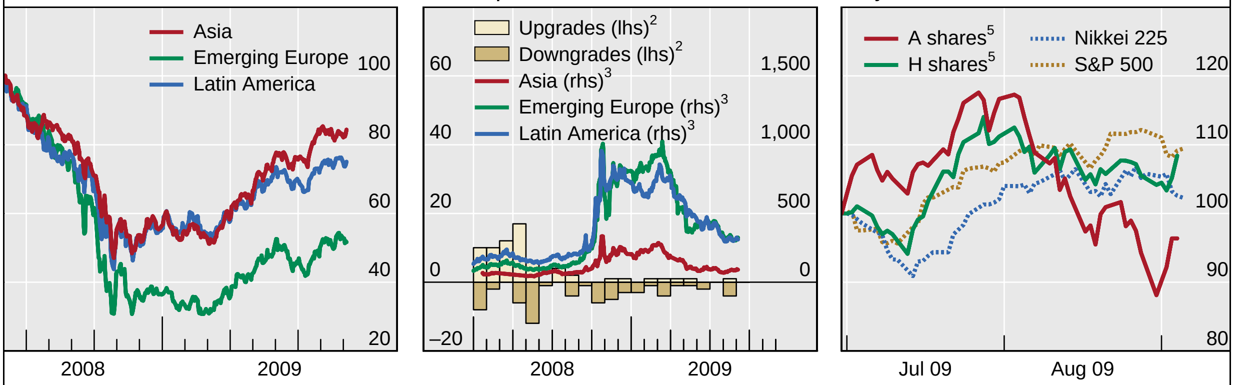
Investors' revived tolerance for risk continued to support emerging market assets. Between end-May and early September 2009, emerging market equities rose along with those in mature markets (Graph 13, left-hand panel). Sovereign and corporate credit spreads narrowed, albeit at a more gradual pace than before (Graph 13, centre panel). Improved market conditions encouraged a further pickup in both domestic and international issuance of debt securities by emerging market corporates (Graph 14, right-hand panel). Equity issuance, which had remained low up to March 2009, began to recover in the second quarter. Portfolio investment flows into emerging markets, which had resumed earlier this year, were sustained over the subsequent months. Emerging market currencies appreciated, though to different degrees, reflecting in part their attractiveness for investors in search of higher yields (Graph 14, centre panel).

Economic rebound in Asia attracts attention

With market participants focusing on the pace and shape of global economic recovery, the strong rebound in activity in emerging Asia attracted

Emerging market indicators

MSCI regional equity prices[1] | Rating actions and sovereign CDS spreads | Chinese equities and selected major indices[4]



[1] In local currency; 1 June 2008 = 100. [2] Monthly rating changes on long-term sovereign debt issued in foreign and local currency. [3] Weighted average of sovereign CDS spreads (in basis points), based on 2005 GDP and PPP exchange rates. Asia = China, Hong Kong SAR, Korea and Singapore; emerging Europe = the Czech Republic, Hungary, Poland, Russia and Ukraine; Latin America = Argentina, Brazil, Colombia, Mexico and Peru. [4] In local currency terms; end-June 2009 = 100. [5] Simple average of 10 largest Chinese companies by market capitalisation listed on both the Shanghai (A shares) and Hong Kong SAR (H shares) exchanges.

Sources: Bloomberg; Datastream; Markit; Standard & Poor's; BIS calculations. Graph 13

attention. In July, the release of preliminary second quarter GDP growth figures for Singapore (an annualised 20%, after several quarters of contraction) and Korea (an annualised 9.7%, the fastest quarterly growth in over five years) provided early hints that the region may be emerging from the downturn. Subsequent data releases from other Asian economies also suggest a revival of activity, attributable to the resumption of trade flows and the effect of fiscal stimulus measures. Expectations of the region's advance recovery added to the growing optimism that supported the demand for emerging market assets.

Market participants pin recovery hopes on Chinese policy stimulus …

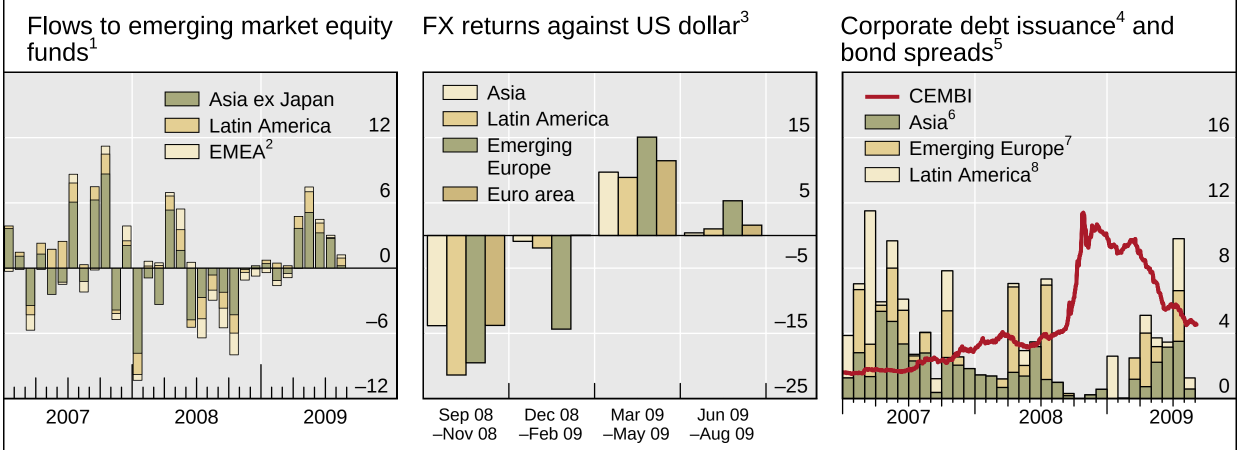
China, in particular, became a focal point for market participants. Its ability to rekindle growth, which had been stalled by the slump in external demand around the turn of the year, was often ascribed to the early and forceful fiscal response of the Chinese authorities. However, since bank lending, especially that by the four large state-owned commercial banks, was instrumental in financing the stimulus, there was growing concern that the resulting rapid rise in bank credit (new lending in the first half of 2009 tripled year on year to over 7 trillion renminbi ($1 trillion)) would exacerbate the build-up of overcapacity in some sectors and fuel asset price inflation.

… but later worry about potential policy tightening

Hopes that robust Chinese growth would lead the global economy to recovery were eventually tempered by fears that the authorities might step in to prevent overexpansion. On 29 July, media reports suggesting an imminent tightening of bank lending drove the Chinese equity market down by more than 5% on the day. Moreover, given its perceived implications for global growth, this news reverberated in other major equity markets in Asia and beyond, temporarily stalling the rally that was under way (see equity markets section above). On 11 August, Chinese data showing less robust than expected industrial production and a sharp month-on-month decline in bank lending

Chinese equity sell-off weighs on other exchanges …

Portfolio flows, currency returns and international debt issuance



[1] In billions of US dollars. [2] Europe, the Middle East and Africa. [3] Simple average of changes in the US dollar spot exchange rate, in per cent. Positive value indicates appreciation against the US dollar. Asia = China, India, Indonesia, Korea and Singapore; Latin America = Argentina, Brazil, Chile and Mexico; emerging Europe = the Czech Republic, Hungary, Poland, Russia and Turkey. [4] International syndicated debt securities (excluding preferred shares); announced issuance by non-financial corporates, in billions of US dollars. [5] In per cent. [6] China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines and Singapore. [7] The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia and Turkey. [8] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

Sources: Bloomberg; Dealogic; EPFR Global; JPMorgan Chase; BIS calculations. Graph 14

provided another occasion for doubts about global growth and prompted further equity selling both at home and abroad.

... but only to a limited degree

That said, the influence of the Chinese equity market on other exchanges was limited. Although selected equity markets outside China did appear to exhibit sensitivity to movements of the Chinese market during this period, they were by no means as volatile. Even the shares of mainland Chinese companies that are traded in Hong Kong SAR (H shares) did not fall by as much as their A share equivalents traded in Shanghai (Graph 13, right-hand panel). The Chinese equity market continued to slide in the second half of August, even as other markets stabilised or recovered. By the end of the month, the Shanghai Stock Exchange Composite Index had declined by over 20% from its early August peak, erasing all its gains since early June.

The significant correction of Chinese equities in August weighed on Asia's overall equity market performance. The MSCI Emerging Markets Asia index was up by only 11% between end-May and 4 September, no longer outperforming the broader World index by as large a margin as in late July. Asian equity markets also ended the period underperforming their counterparts in emerging Europe (with the notable exception of the Russian market, which declined on net over the period) and some markets in Latin America. Data on investment fund flows indicate that while Latin America and emerging Europe equity funds continued to attract net inflows in August, net flows into Asian equity funds shrank to only a small fraction of their magnitudes in the preceding months (Graph 14, left-hand panel).