Search for yield as rates drop further[1]

During the period from mid-June to mid-September, the trajectory of global growth shifted downwards and concerns about the sustainability of euro area government debt and the future of the monetary union gained new traction. Against the backdrop of lower growth, many central banks loosened monetary policy, cutting interest rates or expanding unconventional policies. Some of the policy measures and announcements triggered large asset price reactions.

Together with central bank actions, the combination of weak growth and portfolio reallocations driven by concerns about sovereign risk in the euro area pushed yields on the debt of a number of highly rated sovereigns to unprecedented lows. In a range of European countries, nominal yields on short-term government bonds were even deep in negative territory. Such low yields on advanced economy government bonds spurred investors to search for investment opportunities that offered some extra return. The result was a rally in equities and corporate bonds. Search for yield may also partly explain the extraordinarily low volatility in credit, foreign exchange and equity markets over the past several months.

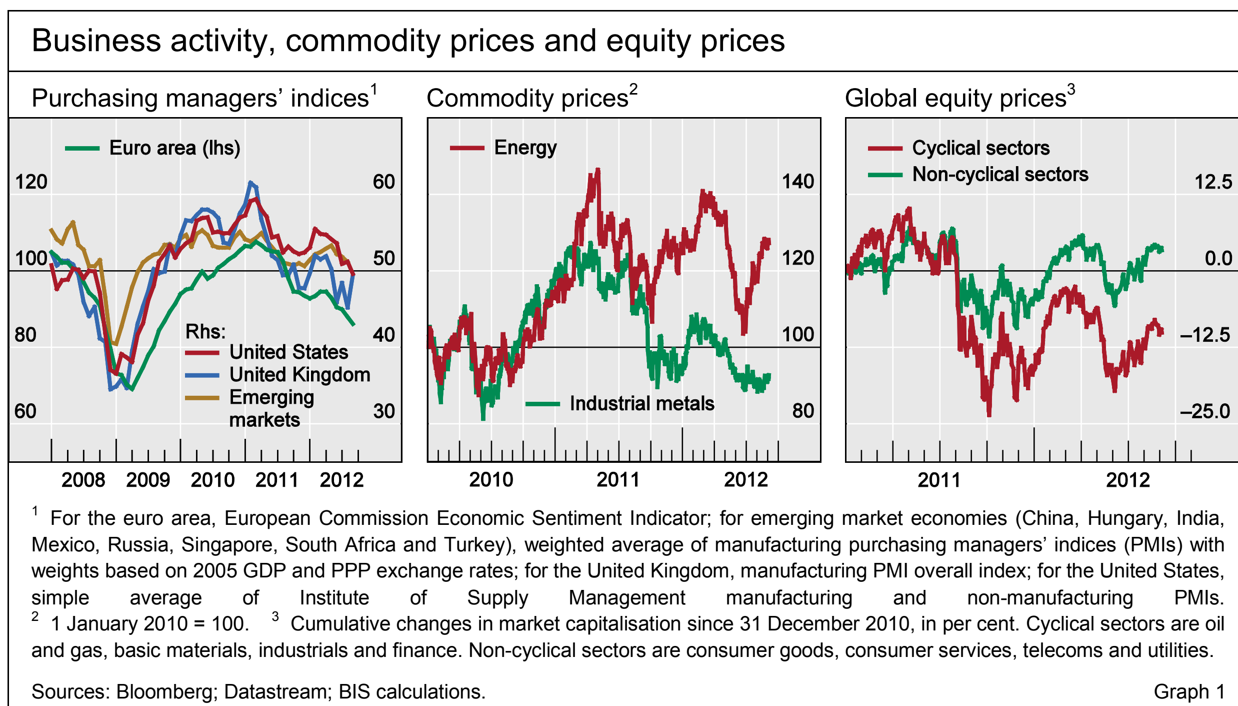
Global growth outlook deteriorates further

Growth weakness spreads …

With macroeconomic data releases surprising mostly on the downside, it became increasingly clear that global economic growth had faltered. Provisional estimates suggested that growth in the second quarter had slowed moderately to 0.4% in the United States and to 0.3% in Japan. The euro area economy contracted by 0.2% and that of the United Kingdom by 0.7%. Surveys of purchasing managers pointed to a further deceleration of economic activity in the third quarter (Graph 1, left-hand panel). The weakness also spread to Germany and several emerging market economies with previously more robust growth.

For the United States, some business cycle indicators such as non-farm payrolls turned out slightly better than expected in July. Nevertheless, the

[1] This article was prepared by the Monetary and Economic Department of the BIS. Questions about the article can be addressed to Andreas Schrimpf (andreas.schrimpf@bis.org), Vladyslav Sushko (vlad.sushko@bis.org) and Nicholas Vause (nick.vause@bis.org). Questions about data and graphs should be addressed to Jhuvesh Sobrun (jhuvesh.sobrun@bis.org) and Agne Subelyte (agne.subelyte@bis.org).



[1] For the euro area, European Commission Economic Sentiment Indicator; for emerging market economies (China, Hungary, India, Mexico, Russia, Singapore, South Africa and Turkey), weighted average of manufacturing purchasing managers' indices (PMIs) with weights based on 2005 GDP and PPP exchange rates; for the United Kingdom, manufacturing PMI overall index; for the United States, simple average of Institute of Supply Management manufacturing and non-manufacturing PMIs. [2] 1 January 2010 = 100. [3] Cumulative changes in market capitalisation since 31 December 2010, in per cent. Cyclical sectors are oil and gas, basic materials, industrials and finance. Non-cyclical sectors are consumer goods, consumer services, telecoms and utilities.

Sources: Bloomberg; Datastream; BIS calculations. Graph 1

economic situation remained fragile, with uncertainty about major fiscal tightening scheduled for the start of 2013 weighing on the growth outlook. Chinese growth fell in the second quarter to its lowest level in three years, and weaker than expected purchasing manager figures pointed to a further slowdown of economic activity.

… but equity markets rally

This negative news had surprisingly little effect on the prices of growth-sensitive assets. Prices of industrial metals such as copper did fall (Graph 1, centre panel). Energy prices, however, picked up as a consequence of tight oil supply conditions and rising international political tensions with Iran. Global equity prices also rose, including in cyclical sectors (Graph 1, right-hand panel). The rise in equity prices was supported by corporate earnings exceeding expectations. During the recent earnings season in the United States and Germany, for example, profits of S&P 500 and DAX companies exceeded analysts' forecasts by about 5% and 16%, respectively. Equity prices also reacted strongly to announcements of additional central bank measures to support the economy (see below) and were affected by expectations about further stimulus should the economic outlook deteriorate further. This points to expected lower discount rates as another driver of recent equity price increases.

Euro area debt crisis continues to weigh on markets

The euro area debt crisis continued to be a key concern for global investors. Mid-June elections in Greece led to the formation of a pro-euro coalition government, easing fears of an imminent exit from the single currency. Greek government bond yields subsequently fell from their post-debt restructuring peaks. Nevertheless, investors anxiously awaited the outcome of an

assessment by the "troika" of Greek compliance with the terms of its support later in the year.

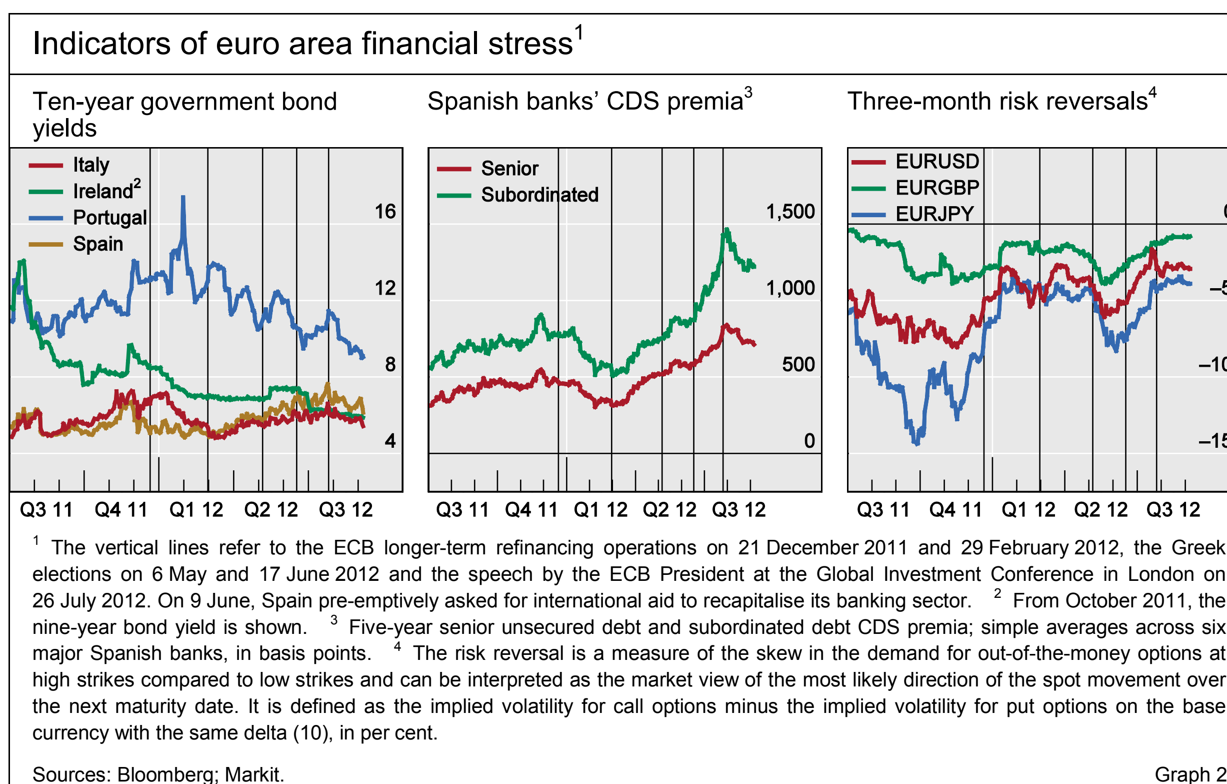
Spanish borrowing costs soar

Meanwhile, Spain's borrowing costs rose significantly when the government asked for international financing to help recapitalise the country's banks in early June. As investors feared that their claims would become further subordinated to the new loans, the request for international credit led to a surge in Spanish government bond yields over much of June and July (Graph 2, left-hand panel). While EU finance ministers confirmed in late July that the new loans will not become senior to existing debt, the terms of the recapitalisation did require some writedowns on subordinated bank debt. Credit default swap (CDS) premia on subordinated debt issued by several Spanish banks rose following an early trickle of this news on 11 July. Premia on senior debt also rose as investors acknowledged the risk that it could be similarly affected in the future (Graph 2, centre panel). Spanish bank covered bond spreads increased as well, partly reflecting the effects of the weak economy on the quality of collateral pools, composed largely of property-related loans.

Uncertainty about the effect of the international credit on the sovereign debt burden was another key driver of Spain's surging borrowing costs. This was further reinforced by the deepening of the country's recession and by new requests by some Spanish regions for emergency credit lines from the central government. All this led Spanish 10-year sovereign yields to increase by about 70 basis points to reach a peak of 7.6% on 24 July. The distress was even more pronounced in the case of shorter-term bonds, with two-year yields climbing more than 170 basis points to 6.8% by the end of July.

Other euro area sovereign bond markets also faced selling pressure over this period. Notably, 10-year yields on Italian government debt tracked higher

Indicators of euro area financial stress[1]



[1] The vertical lines refer to the ECB longer-term refinancing operations on 21 December 2011 and 29 February 2012, the Greek elections on 6 May and 17 June 2012 and the speech by the ECB President at the Global Investment Conference in London on 26 July 2012. On 9 June, Spain pre-emptively asked for international aid to recapitalise its banking sector. [2] From October 2011, the nine-year bond yield is shown. [3] Five-year senior unsecured debt and subordinated debt CDS premia; simple averages across six major Spanish banks, in basis points. [4] The risk reversal is a measure of the skew in the demand for out-of-the-money options at high strikes compared to low strikes and can be interpreted as the market view of the most likely direction of the spot movement over the next maturity date. It is defined as the implied volatility for call options minus the implied volatility for put options on the base currency with the same delta (10), in per cent.

Sources: Bloomberg; Markit. Graph 2

for much of July, reaching a peak of 6.6% on 24 July. Contagion from Spain may have accounted for part of this rise, but domestic factors also played a role as the Italian central government provided financial assistance to Sicily and Moody's downgraded Italy's sovereign rating by two notches on 13 July. In currency markets, the trade-weighted external value of the euro declined up to the end of July as capital flowed out of the euro area.

Sentiment turns …

Following the ECB President's statement in a speech on 26 July that "within our mandate, the ECB is ready to do whatever it takes to preserve the euro", yields on Italian and Spanish bonds fell significantly. Yields on shorter-term paper dropped the most. Market expectations that any prospective ECB policy action would focus on purchasing shorter-term bonds may have accounted for part of this decline. Details of the ECB's new programme of outright monetary transactions (OMTs) were finally unveiled on 6 September. The programme involves discretionary sterilised purchases of short-term sovereign bonds under certain conditions and is subject to a prior request by the respective country's government for international assistance via the European Financial Stability Facility / European Stability Mechanism (EFSF/ESM).

… on news about policy action

The news of a more active stance of the ECB had a broad impact on market sentiment. Global equity prices surged over much of August. Yields on German bunds and other higher-rated euro area government bonds rose. Also around this time, the Irish government regained access to international capital markets by issuing longer-term bonds with yields below those of Spain. The value of the euro against other major currencies recovered during most of August. Nevertheless, exchange rate risk reversals suggested that investors continued to pay a premium to hedge against future sharp decreases in the value of the currency (Graph 2, right-hand panel).

Weak growth outlook prompts central bank support

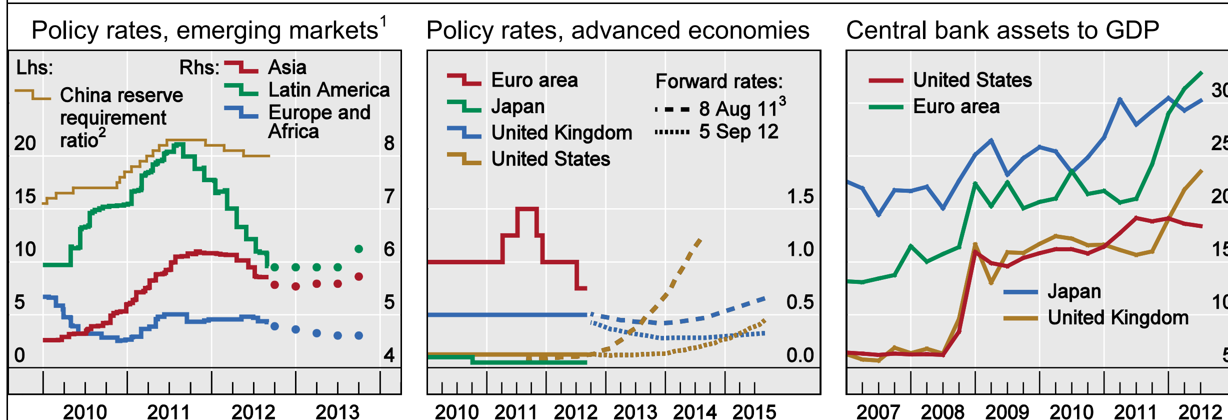
Some central banks cut rates further …

Against the background of the weaker growth outlook, central banks in both emerging market and advanced economies took further steps to ease monetary policy. The central banks of Brazil, China, Colombia, the Czech Republic, Israel, Korea, the Philippines and South Africa lowered policy rates (Graph 3, left-hand panel). The rate cuts in China followed reductions in bank reserve requirement ratios earlier in the year. Forecasts of future policy rates in emerging market economies (dots in Graph 3, left-hand panel) imply few further cuts, however.

Central banks in advanced economies also eased monetary policy further. In early July, the ECB lowered its main refinancing rate by 25 basis points to 75 basis points and cut the interest rate on its deposit facility to zero (Graph 3, centre panel). This brought the remuneration of balances in the deposit facility into line with that on banks' current accounts, reducing the incentive to transfer excess reserves into the deposit facility at the end of each business day. That said, banks kept the total amount of reserves unchanged. Also, some money market funds stopped accepting new investments, as negative nominal interest rates made it difficult for them to offer positive returns to their investors.

Monetary policy indicators

In per cent



[1] Asia: China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines and Thailand. Europe and Africa: the Czech Republic, Hungary, Poland, Russia and South Africa. Latin America: Brazil, Chile, Colombia and Mexico. Weighted averages based on 2010 GDP and PPP exchange rates. The dots show JPMorgan Chase forecasts as of 31 August 2012 for policy rates at the end of September 2012, December 2012, March 2013, June 2013 and September 2013. [2] For major banks. [3] Last trading day before the Federal Reserve first announced its intention to keep the federal funds rate exceptionally low over a specified horizon.

Sources: Bloomberg; Datastream; JPMorgan Chase; national data.

Graph 3

… while others expand unconventional policies

With policy rates already close to zero and expected to remain around this level for quite some time, central banks in large advanced economies extended or renewed unconventional monetary policies targeting long-term high-quality assets (Graph 3, centre and right-hand panels). On 5 July, the Bank of England announced an increase in the size of its Asset Purchase Facility by £50 billion to a total of £375 billion, financed by an expansion of central bank reserves. Likewise, on 20 June, the Federal Reserve announced a second programme to extend the maturity of its Treasury holdings. The programme involves buying $267 billion of Treasury securities with remaining maturities of six to 30 years financed by the sale or redemption of an equal amount of Treasuries with maturities of three years or less. The Bank of Japan continued its regular purchases as a part of its Asset Purchase Program.

Discussions about central bank asset purchases featured prominently in financial commentary during the period. But, as it turned out, the actual announcements had surprisingly little impact on asset prices (see box). By contrast, government bond yields reacted strongly to news about the future path of short-term interest rates. For example, yields on two-year US Treasury notes fell by 10 basis points on 22 August after the publication of the minutes of the latest meeting of the Federal Open Market Committee. Observers interpreted the minutes as indicating that the federal funds rate target could remain low for even longer than previously expected. Yields also dropped significantly on 31 August when Chairman Bernanke expressed concern over the US labour market situation and alluded to costs and benefits of further unconventional policies in his address at the Jackson Hole conference (Graph A). This indicated that market participants remained highly sensitive to news of future policy direction.

Unconventional policies: market impact and countervailing factors

Torsten Ehlers and Vladyslav Sushko

Central bank asset purchases can affect credit growth and real activity through a variety of channels.[1] Policy transmission begins with market reactions to official statements or anticipations thereof. The mere announcement of asset purchases can signal commitment to monetary stimulus, thereby lowering the expected path of future short-term rates (signalling channel). In addition, central banks can remove duration from the market through purchases of longer-term securities. This will lower longer-term yields, inducing investors to rebalance their portfolios towards assets with greater risk (portfolio rebalancing channel). While such portfolio rebalancing takes time, in forward-looking markets the central bank's commitment to purchases alone can trigger portfolio adjustments. Further, if asset purchase programmes are anticipated, investors will price them in even before the specifics are announced. As a result, policy announcements will affect yields only if they deliver an additional element of "surprise" to the market.

Unconventional asset purchase measures were typically first introduced during the crisis management stage, when the solvency and liquidity of major financial institutions hung in the balance.[2] Yet, as the focus shifts to economic recovery, at least outside the euro area, this has raised questions about diminishing market reactions to further extensions of such purchases.

A comparison of yield changes on key assets at the time of past programme announcements with more recent ones suggests that the announcement effects of asset purchase programmes have waned. Yields on Treasury securities, mortgage-backed securities (MBS) and corporate bonds hardly moved on 20 June 2012, when the Federal Reserve announced the extension of the maturity of its Treasury portfolio (Graph A). In contrast, the September 2011 announcement of the initial Maturity Extension Program (MEP1), along with further purchases of MBS, coincided with immediate declines in long-term yields of Treasuries and MBS. Furthermore, the announcement of the first round of Large-Scale Asset Purchases (LSAP1) back in 2009 was associated with significantly larger declines in Treasury yields across all maturities, ranging from 26 to 51 basis points. Similarly, the response of gilt yields to the Bank of England's expansion of its Asset Purchase Facility (APF2), while still significant for five- and 10-year maturities, has been muted compared to the introduction of the programme back in March 2009.

A variety of factors may explain these patterns. First, the novelty and surprise element of asset purchase measures may have waned. In this case, changes in asset prices on announcement days may understate the overall market impact since investors may have learned to anticipate them. As a result, greater announcement impact may now come from less anticipated statements and policy innovations, such as when the Bank of England announced the Funding for Lending Scheme.

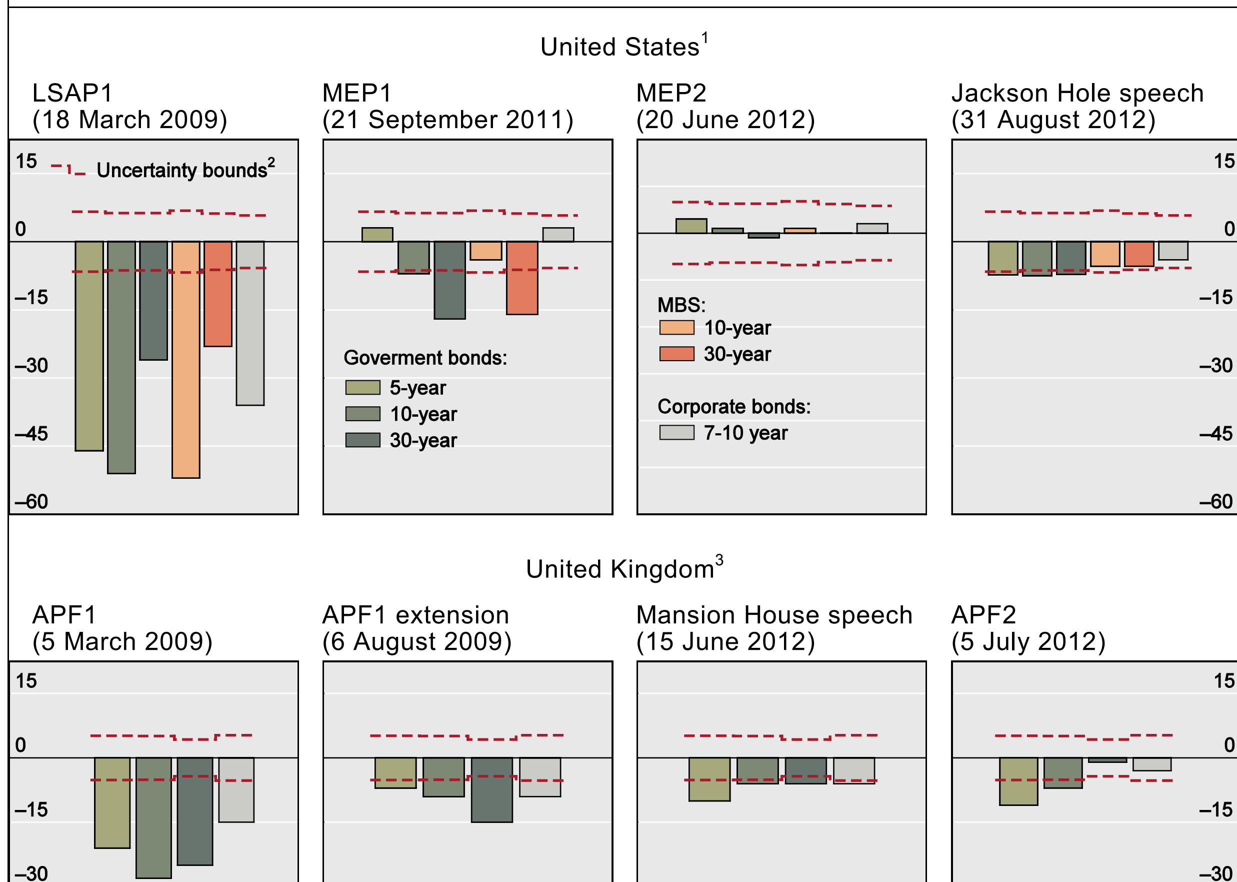
Second, with policy rates close to zero, it is unlikely that asset purchase measures would lower expectations of future interest rates any further by signalling the future policy stance. This is especially true in countries where central banks have been complementing asset purchase policies with explicit signals that future short-term risk-free rates would remain low. For example, the Federal Reserve's forward guidance on keeping interest rates low for an extended period may have firmly anchored expectations of future short-term rates.

Third, despite central bank purchases, the maturity of outstanding public debt has continued to increase. For example, despite the Federal Reserve's purchases, the cumulative public holdings (ie excluding the Federal Reserve) of Treasury debt with a maturity of one year or more have risen by approximately $3 trillion since the beginning of 2009 and their average maturity has risen from about 50 to 60 months. Hence, in order to have the same duration impact, central banks may have to increase the maturity of their Treasury holdings at an even higher rate. Such diminishing duration impact per dollar of purchases going forward may also be reflected in a lower market impact on announcement.

Finally, negative term premia imply that the margin of adjustment for long-term yields has diminished further (Graph 4). This would impede the portfolio rebalancing channel because when the central bank removes duration from the Treasury market, the reduction in yields on other assets comes primarily through a narrowing in their risk premia. For long-term assets, the main component would have been the term premium. In addition, when the solvency and liquidity of major financial institutions hung in the balance in 2009, credit and liquidity risk premia would have been affected as

Yield changes associated with policy measures and central bank statements

One-day change since previous day's closing yield, in basis points



[1] Announcement dates for Federal Reserve purchases are: increase in total Treasury debt and MBS purchases to $1.25 trillion (18 March 2009), the Maturity Extension Program and reinvestment of agency MBS and agency debt principals into MBS (21 September 2011), the announcement of further maturity extension via the $267 billion purchase (sale) of long-term (short-term) Treasuries (20 June 2012) and the Jackson Hole speech by Chairman Bernanke in which he expressed concern over the US labour market and alluded to costs and benefits of monetary easing (31 August 2012). [2] Uncertainty bounds based on a 97.5% confidence interval calculated using the historical standard deviation of yield changes for each asset class. [3] Announcement dates for Bank of England purchases are: the announcement of the £75 billion Asset Purchase Facility and bank rate cut from 1% to 0.5% (5 March 2009), the extension of the Asset Purchase Facility to £175 billion (6 August 2009), the Mansion House speech introducing the Funding for Lending Scheme (15 June 2012) and the announcement of a further £50 billion of asset purchases (5 July 2012).

Sources: Bank of America Merrill Lynch; Bloomberg; national data; BIS calculations. Graph A

well. By now, however, the scope for affecting these components of the risk premium, and hence for lowering yields across asset classes, has diminished.

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① For announcement effects, see eg J Meaning and F Zhu, "The impact of Federal Reserve asset purchase programmes: another twist", *BIS Quarterly Review*, March 2012, pp 23–32; and M Bauer and G Rudebusch, "The signaling channel for Federal Reserve bond purchases", *FRBSF Working Paper Series*, no 2011–21, December 2011. For the portfolio balance channel, see J Gagnon, M Raskin, J Remache and B Sack, "The financial market effects of the Federal Reserve's large-scale asset purchases", *International Journal of Central Banking*, vol 7(1), March 2011, pp 3–43. Irrespective of the transmission channel, there is strong evidence of the effectiveness of asset purchases since 2009; see eg S D'Amico and T King, "Flow and stock effects of large-scale Treasury purchases: evidence on the importance of local supply", *Federal Reserve Board Finance and Economics Discussion Series*, working paper no 2012–44, February 2012. ② Further, central bank balance sheet measures adopted in the wake of the global financial crisis provided temporary support to economic activity and consumer prices. See L Gambacorta, B Hofmann and G Peersman, "The effectiveness of unconventional monetary policy at the zero lower bound: a cross-country analysis", *BIS Working Papers*, no 384, August 2012.

In addition to extending or renewing earlier programmes, some central banks took measures targeted more specifically at restoring the flow of credit to

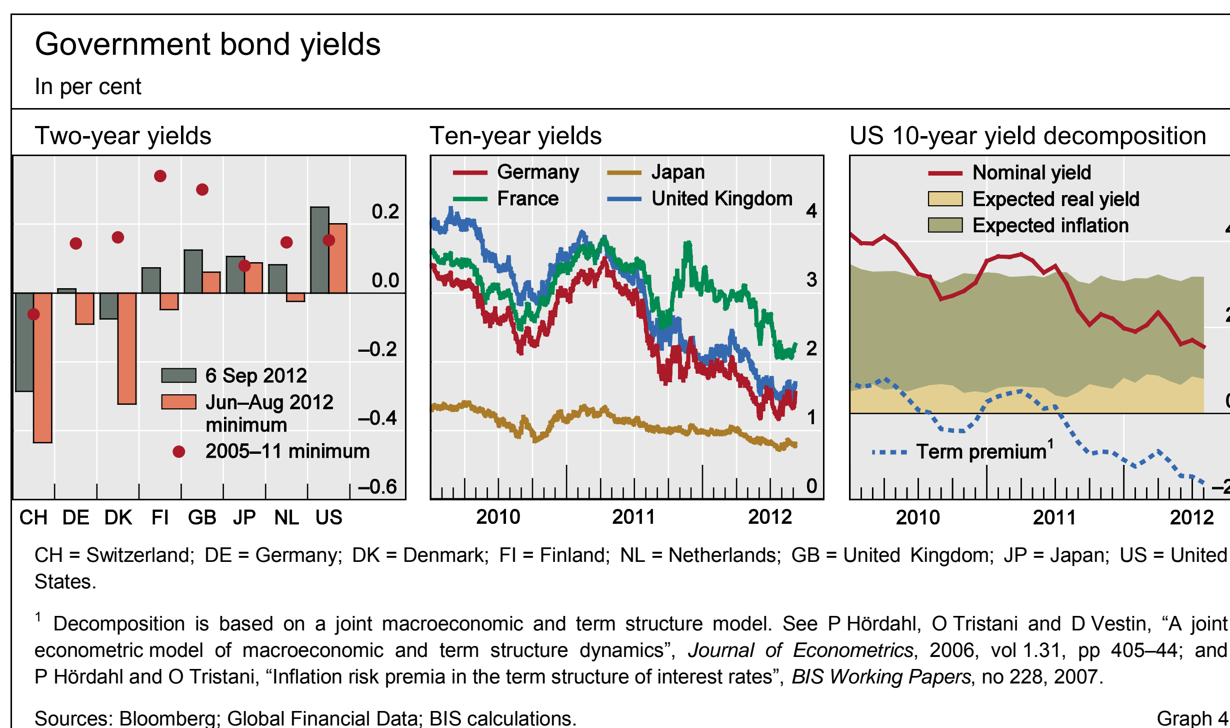
the economy. In his Mansion House speech in London on 14 June, the Governor of the Bank of England announced a new Funding for Lending Scheme (FLS); the technical details were unveiled on 13 July. The FLS provides funding to banks on terms that are conditional upon the performance of banks in sustaining or expanding their lending to UK households and non-financial companies. Corporate bond yields dropped by 6 basis points on the following trading day, and yields on gilts fell 5–10 basis points. The latter decline possibly reflected market participants' expectation that growth would remain weak and monetary policy expansionary for longer than previously thought. Meanwhile, the Bank of Japan made public plans to provide US dollar-denominated loans as part of a similar programme. Since its inception in 2010, the programme has been providing discounted long-term funds to financial institutions based on their actual lending activity.

Ultra-low yields

A combination of weak growth, central bank policy actions and portfolio reallocations driven by concerns about sovereign risk in the euro area pushed yields to unprecedented lows. Yields on the short-term paper of a few highly rated sovereigns, most notably Switzerland and Germany, had already been close to zero (or negative) during earlier euro area distress episodes. These dynamics gained additional force after the ECB cut the interest paid on its deposit facility to zero on 5 July.

Yields at historical lows …

In the days after the announcement, yields on higher-rated European short-term government bonds plunged to lows not previously recorded (Graph 4, left-hand panel). Short-term yields of the Netherlands, Finland and Austria, for instance, decreased sharply and temporarily turned negative. Their spreads over German bunds tightened considerably. At the most extreme,



Government bond yields

In per cent

CH = Switzerland; DE = Germany; DK = Denmark; FI = Finland; NL = Netherlands; GB = United Kingdom; JP = Japan; US = United States.

[1] Decomposition is based on a joint macroeconomic and term structure model. See P Hördahl, O Tristani and D Vestin, "A joint econometric model of macroeconomic and term structure dynamics", *Journal of Econometrics*, 2006, vol 1.31, pp 405–44; and P Hördahl and O Tristani, "Inflation risk premia in the term structure of interest rates", *BIS Working Papers*, no 228, 2007.

Sources: Bloomberg; Global Financial Data; BIS calculations. Graph 4

yields on Swiss and Danish two-year government bonds fell below –40 basis points and –30 basis points, respectively. Both countries (effectively) link their currency to the euro. In an effort to reduce pressure on the krone, the Danish central bank entered uncharted waters by lowering the rate on its deposit facility to –20 basis points. In primary markets, Germany sold over €4 billion of two-year Treasury notes at an average yield of –6 basis points in mid-July. France, Belgium and the Netherlands also held auctions in which short-term government paper was sold to investors at negative yields.

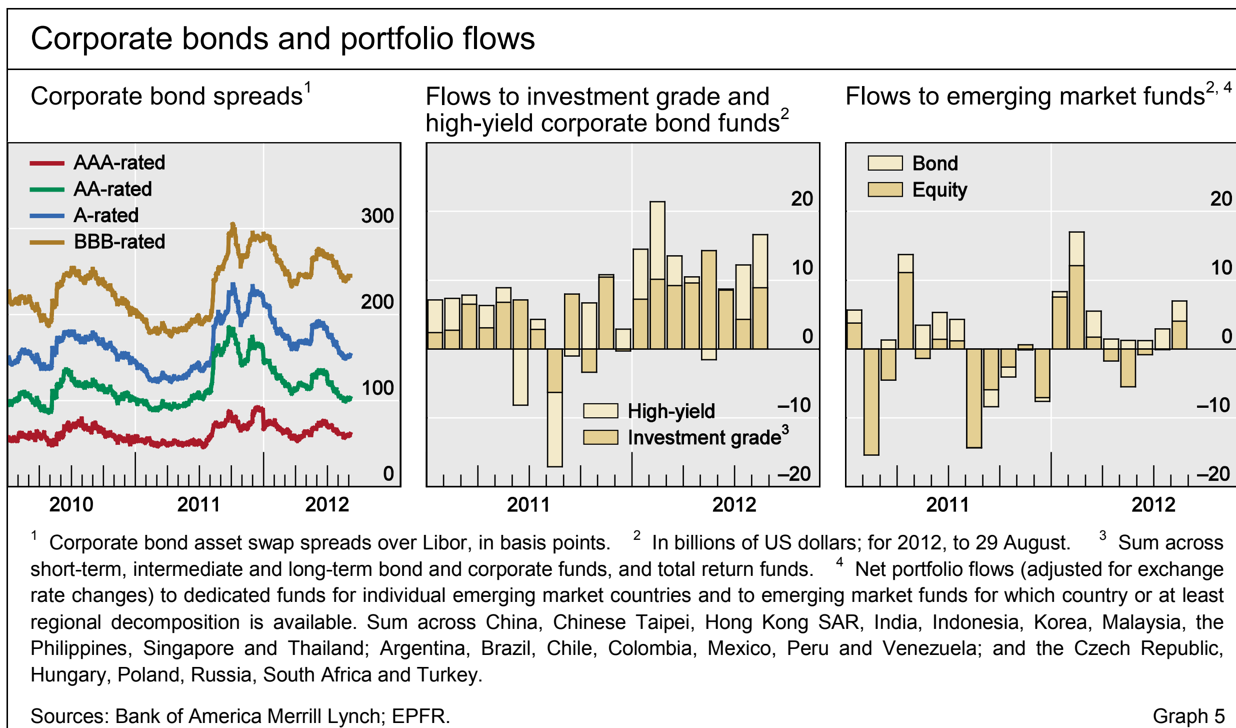
Long-term government bond yields in several countries also fell to record lows (Graph 4, centre panel). In July, 10-year US government bond yields reached their lowest for more than 200 years. Graph 4 (right-hand panel) shows an estimate of the decomposition of these yields into compensation for future inflation, real (after expected inflation) short-term interest rates available over the life of the bonds and the term premium. The term premium is usually positive since it compensates investors for the interest rate risk of holding long-duration assets. However, the estimated term premium has fallen to about –150 basis points most recently, reflecting the combined effects of central bank bond purchases and safe haven demand for long-term US Treasuries.

Search for yield in an ultra-low rate environment

… support asset prices

With sovereign yields at historical lows, investors increasingly looked beyond benchmark government bonds in search of reasonably safe investments offering some extra yield. Such portfolio rebalancing is one of the key objectives of unconventional policies (as discussed in the box), intended to stimulate investor risk-taking by reducing the attractiveness of government securities relative to risky assets.

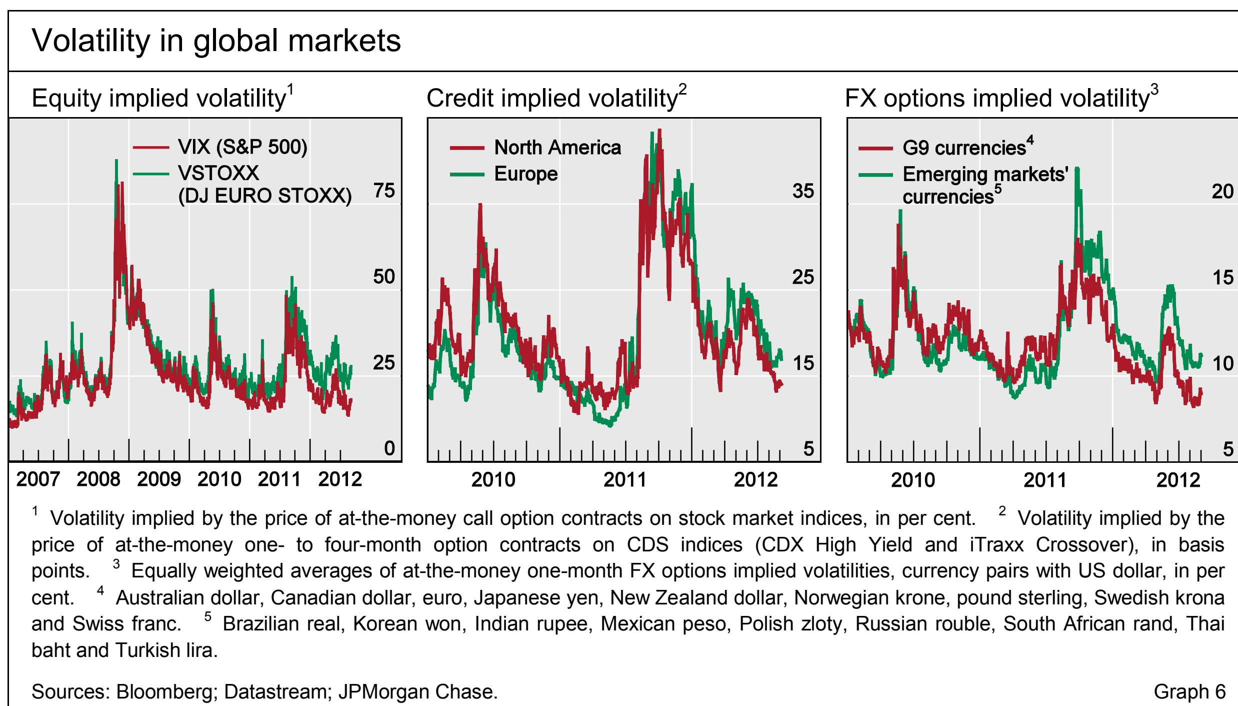
Corporate bonds and portfolio flows



[1] Corporate bond asset swap spreads over Libor, in basis points. [2] In billions of US dollars; for 2012, to 29 August. [3] Sum across short-term, intermediate and long-term bond and corporate funds, and total return funds. [4] Net portfolio flows (adjusted for exchange rate changes) to dedicated funds for individual emerging market countries and to emerging market funds for which country or at least regional decomposition is available. Sum across China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand; Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela; and the Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Sources: Bank of America Merrill Lynch; EPFR.

Graph 5



Volatility in global markets

[1] Volatility implied by the price of at-the-money call option contracts on stock market indices, in per cent. [2] Volatility implied by the price of at-the-money one- to four-month option contracts on CDS indices (CDX High Yield and iTraxx Crossover), in basis points. [3] Equally weighted averages of at-the-money one-month FX options implied volatilities, currency pairs with US dollar, in per cent. [4] Australian dollar, Canadian dollar, euro, Japanese yen, New Zealand dollar, Norwegian krone, pound sterling, Swedish krona and Swiss franc. [5] Brazilian real, Korean won, Indian rupee, Mexican peso, Polish zloty, Russian rouble, South African rand, Thai baht and Turkish lira.

Sources: Bloomberg; Datastream; JPMorgan Chase. Graph 6

Corporate bond spreads fell as investors raised their credit risk exposure to the corporate sector and the asset class saw large inflows from investors (Graph 5, left-hand and centre panels). From mid-June to end-August, bond spreads moved down by 17 basis points for AAA-rated corporates and more than 30 basis points for other investment grade corporate bonds (Graph 5, left-hand panel). Consistent with search for yield behaviour and increased risk-taking induced by the low rate environment, issuance of high-yield bonds in primary markets picked up strongly. Lower-rated corporate issuers took advantage of benign market conditions to place large amounts of high-yield bonds with investors. High-yield bond funds also attracted large inflows (Graph 5, centre panel). Likewise, emerging market bond funds saw inflows from investors willing to take on credit risk to earn some extra yield (Graph 5, right-hand panel). This was also reflected in the tightening of spreads on emerging market debt securities.

Volatility very low despite uncertainty

The volatility of risky assets remained extraordinarily subdued given the concerns about the euro area debt crisis and the poor outlook for growth (Graph 6). Volatility was low compared to recent history in credit, foreign exchange and equity markets. On 13 August, the implied volatility index (VIX) computed from the prices of US equity market options fell to its lowest value since June 2007. With real government bond yields in negative territory in many countries, this means that equity valuations have become more attractive relative to bonds, which in turn may have pushed some investors to increase the equity share of their portfolios. As a consequence, assets traditionally perceived as risky may have been less affected by the deterioration of the growth outlook and the euro area strains compared to previous episodes.