Inflation pressures rise with commodity prices[1]

In the period from the beginning of December 2010 to the last week of February 2011, investors priced in a strengthening of economic activity in major mature economies and a growing likelihood that the recovery had finally reached escape velocity. This improved growth outlook had a visible impact on financial markets: equity prices rose and credit spreads tightened in major advanced economies. Government bond yields also increased significantly, reflecting both higher expected real yields due to anticipated monetary policy tightening and higher expected inflation. During the last week of February, however, investor sentiment suffered a marked setback as concerns mounted about the repercussions of the political unrest in North Africa and the Middle East.

The rise in inflation expectations, especially in the near term, was due not only to the stronger growth outlook but also to rapidly rising prices for agricultural and other commodities, in particular food. Worries about global demand for food outpacing supply in several key markets are likely to have been an important factor in these increases. The surging prices prompted renewed concerns among investors and policymakers about the inflationary impact of higher commodity prices across the globe and possible second-round effects. Accelerating oil price increases in the wake of escalating political tensions in North Africa and the Middle East added further to these concerns.

While asset prices in mature economies were primarily driven by continued signs of a self-sustaining recovery, equity and bond prices in a number of emerging economies began to reflect increasing investor concerns about the impact of policy tightening in response to rising inflation. Moreover, the changing global outlook led investors to rebalance their portfolios geographically. This resulted in outflows from equity markets in Asia and Latin America and inflows into developed economy equity markets.

[1] This article was produced by the BIS Monetary and Economic Department. The analysis covers the period until 3 March 2011. Questions about the article can be addressed to jacob.gyntelberg@bis.org or peter.hoerdahl@bis.org. Questions about data and graphs should be addressed to magdalena.erdem@bis.org or garry.tang@bis.org.

Recovery optimism versus political unrest

Equities rise and bonds drop in advanced economies as the recovery takes hold …

From early December until the last week of February both equity and bond market developments suggested that investors were beginning to price in an improved growth outlook for major advanced economies. A steady trickle of positive data releases continued to indicate that a recovery was taking hold in the advanced economies, particularly in Japan and the United States. This growing optimism resulted in significant increases in equity prices in major economies over the period under review (Graph 1, left-hand panel). Similarly, corporate credit spreads continued to tighten and longer-term government bond yields rose (Graph 1, centre panel). The increase in bond yields reflected a combination of higher expected inflation and expectations of higher real yields (see below). The change in investor sentiment in favour of equities over bonds was clearly visible in US mutual fund flows, with bond market funds experiencing outflows in December, as investors rebalanced their portfolios towards equities (Graph 1, right-hand panel).

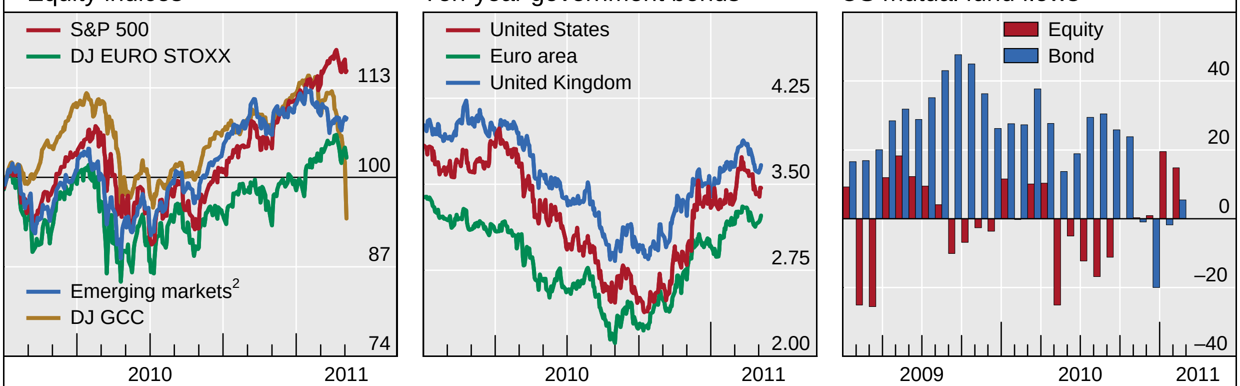
…while inflation worries weigh on emerging markets

In emerging market economies, investors focused on the impact of future policy tightening in response to the growing inflation momentum in a number of countries. The changed outlook caused equity prices in several emerging markets to decline starting in December (Graph 1, left-hand panel). It was also reflected in outflows from US mutual funds targeting emerging markets and inflows into developed economy equity market funds (Graph 2, left-hand panel). This signalled the end to a period with high capital inflows into Asia and Latin America: in February all emerging market focused funds saw net outflows (Graph 2, right-hand panel).

Sentiment suffered a notable setback during the last week of February, as concerns about the impact of political unrest in North Africa and the Middle East led to oil price spikes. This change was clearly seen across global markets. Safe haven flows caused the Swiss franc to appreciate against the US dollar, and global equity prices declined. Implied equity option volatilities – an often-used

Equity prices, bond yields and US mutual fund flows

Equity indices[1] | Ten-year government bonds[3] | US mutual fund flows[4]

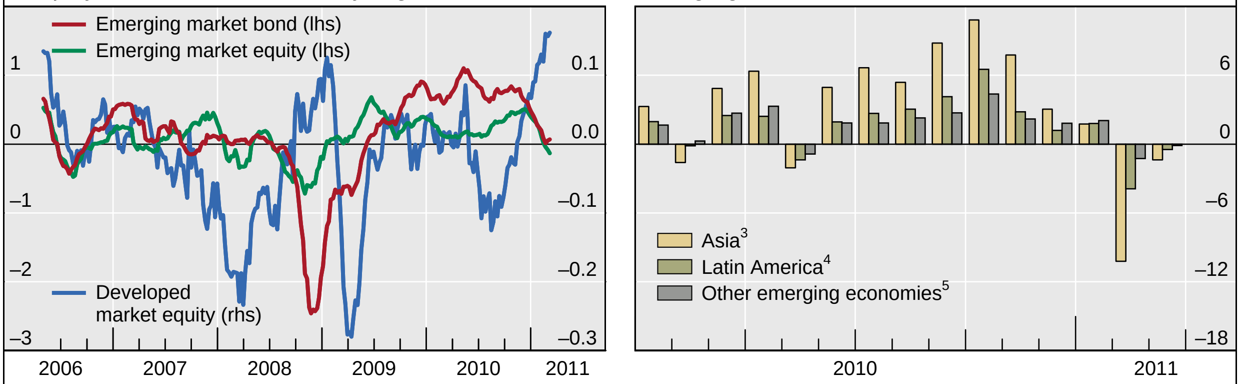


[1] 4 January 2010 = 100. [2] Average of Asian, European and Latin American emerging market equity indices. [3] In per cent. [4] In billions of US dollars. For February 2011, estimated flows until the 23rd.

Sources: Bloomberg; Datastream; EPFR; Investment Company Institute. Graph 1

Global portfolio rebalancing

Equity and bond fund flows by region[1] | Emerging market fund flows[2]



[1] Ratio of 13-week moving average of fund flows to respective net total assets, in per cent. [2] Sum of weekly equity and bond flow data up to 2 March 2011, in billions of US dollars. [3] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Sources: EPFR; BIS calculations. Graph 2

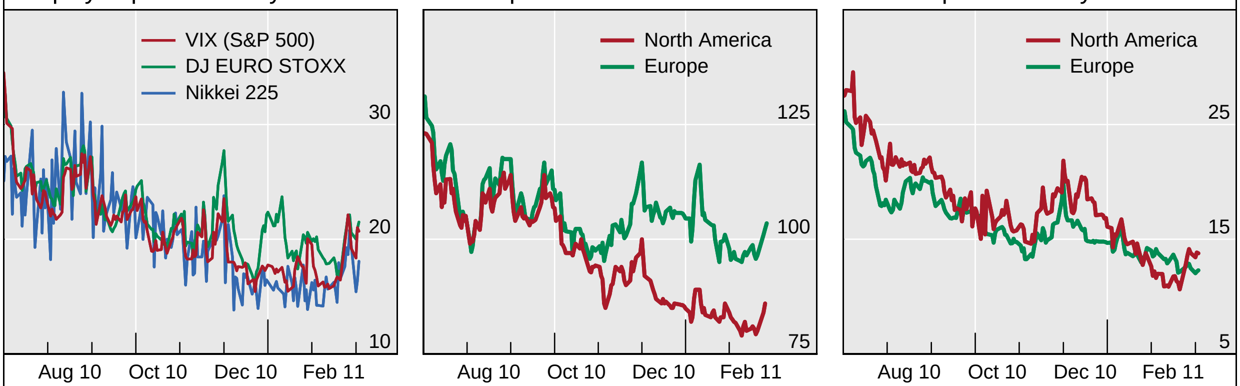
indicator of investor risk perceptions – jumped by around two thirds (Graph 3, left-hand panel). In credit markets, spreads widened substantially in a matter of days while implied credit volatilities reversed their downward trend (Graph 3, centre and right-hand panel).

Fiscal outlook still a focus area

Investors remained focused on public debt levels and fiscal developments in mature economies. Japanese sovereign debt was downgraded by Standard & Poor's in late January and put on negative credit outlook by Moody's in late February, in part due to the expected increase in the debt-to-GDP ratio (Graph 4, left-hand panel). Equity markets appeared to react negatively to the rating changes, but the response in bond markets was hardly noticeable,

Volatility in equity and credit markets

Equity implied volatility[1] | Credit spreads[2] | Credit implied volatility[3]

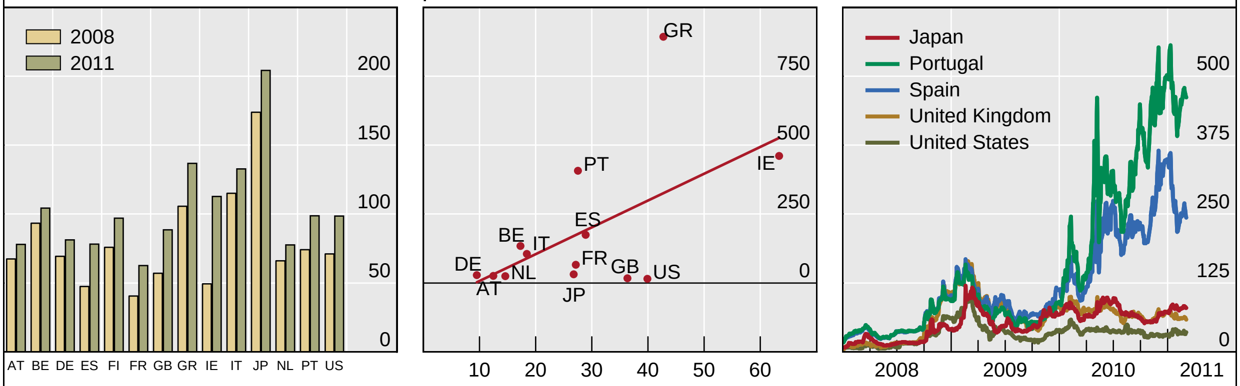


[1] Volatility implied by the price of at-the-money call option contracts on stock market indices, in per cent. [2] Five-year on-the-run CDS mid-spread on index contracts of investment grade (CDX North America; iTraxx Europe), in basis points. [3] Volatility implied by the price of at-the-money one- to four-month option contracts on CDS indices (CDX High Yield; iTraxx Crossover), in basis points.

Sources: Bloomberg; Datastream; BIS calculations. Graph 3

Government debt, deficits and sovereign credit premia

Government debt[1] | Deficits vs changes in CDS premia[2] | Sovereign CDS spreads[3]



AT = Austria; BE = Belgium; DE = Germany; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; GR = Greece; IE = Ireland; IT = Italy; JP = Japan; NL = Netherlands; PT = Portugal; US = United States.

[1] General government gross financial liabilities as a percentage of GDP. [2] The horizontal axis shows cumulative government deficits as a percentage of GDP for 2007–11 (for 2007–09, actual data; for 2010–11, projections); the vertical axis represents changes in CDS premia between 26 October 2009 and 2 March 2011. [3] In basis points.

Sources: OECD; Markit; national data. Graph 4

possibly owing to the high percentage of Japanese government bonds held by domestic investors. Sovereign credit spread developments for a number of other countries continued to reflect their uncertain fiscal outlook (Graph 4, centre panel).

Fiscal concerns continue to linger

Concerns about the fiscal situation in Spain and Portugal continued to linger. After the rescue package for Ireland, investors' focus turned to the sustainability of Portugal's fiscal situation as yields on Portuguese debt continued to reach new highs. As a result, the possibility that Portugal might tap the European Financial Stability Facility was seen by many as increasing over the period. Starting on 10 January a gradual decline in sovereign credit spreads provided signs of a slight easing of investor concerns (Graph 4, right-hand panel). The improved sentiment was in part driven by lower budget deficits and fiscal austerity initiatives in Spain as well as the successful issuance of EU bonds in early January. The EU bond issues were oversubscribed, benefiting from a Japanese pledge to buy 25% of the bonds. The lower spreads may also have reflected a decline in the number of short positions in both credit and currency markets as investor sentiment improved. This improvement also resulted in higher European bank equity prices while bank credit spreads narrowed. During January and February developments in Spanish bank bond and equity prices also reflected the release of more detailed information about property sector exposures as well as the introduction of stricter capital requirements.

Food, oil and other commodity prices increase

Commodity prices soar

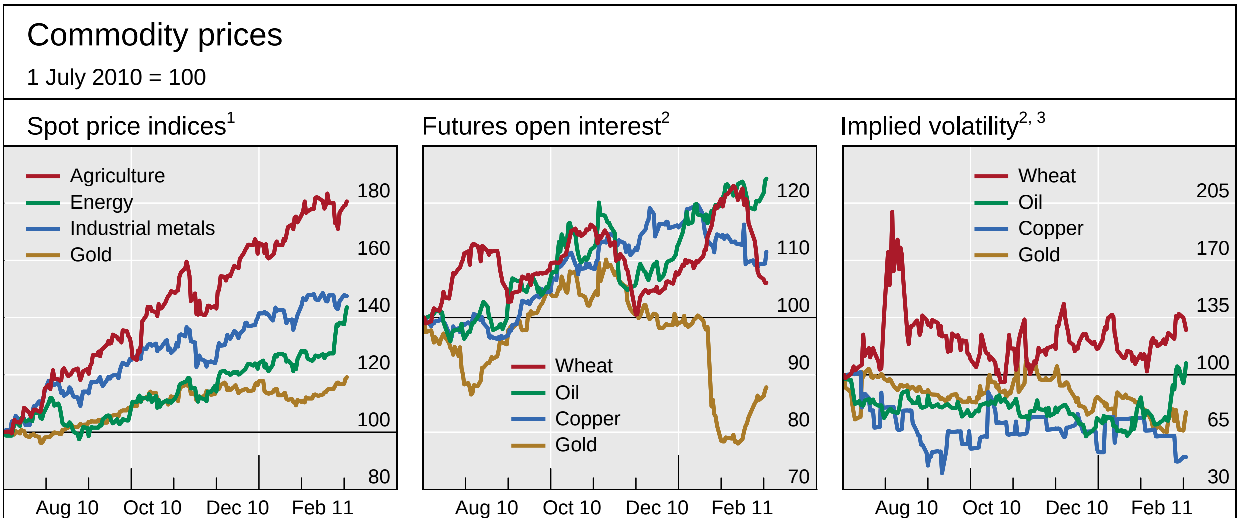
Commodity prices surged over the period under review, with food and oil prices seeing the largest increases (Graph 5, left-hand panel). The significant food price increases in part reflected concerns about future supply, driven by weatherrelated declines in global production. The surge in prices led some policymakers and commentators to express concerns about the possible political and inflationary impact of higher food prices in emerging and developing economies.

The factors behind increasing prices for food and other commodities differed somewhat. In the case of food, prices were mainly driven by concerns about low future supply due to flooding in Australia and disappointing harvests as a result of bad weather in Ukraine, Russia, China and Pakistan. For several commodities, low inventories added to the price pressures. The most visible impact was on wheat, which is one of the commodities most affected by supply concerns. However, futures prices indicated that food supply is expected to increase and that prices may stabilise later this year. In contrast to food prices, the rise in energy and metal prices seemed to be driven by longer-run demand pressures stemming from the expected path of global growth.

The rapid rise in food prices was accompanied by significant increases in open interest positions in futures markets (Graph 5, centre panel). The futures markets for wheat, maize (corn) and soybeans saw the largest and most rapid increases, reflecting lower inventories and greater concerns about future demand outstripping supply. Despite the increase in futures positions, it is unclear to what extent financial factors were a key driver of spot prices. In particular, price increases in a number of markets preceded the rise in futures positions. Also, financial investments linked to commodity price indices, another possible driver of commodity prices, do not appear to have grown much over the period. Consistent with a tight but predictable supply/demand situation, several commodity markets have seen declines in implied option volatilities (Graph 5, right-hand panel) as well as a steepening of futures price curves.

Libyan unrest adds further pressure on oil

Oil prices soared in the last week of February in the wake of mounting concerns that the political unrest in Libya could spread to other major oil producers in the region and disrupt global oil production. Assurance from the oil producers' cartel that they stood ready to increase supply to avoid shortages



[1] S&P GSCI indices. [2] For copper, LME copper futures; for gold, COMEX gold 100oz futures; for oil, NYMX WTI crude futures; for wheat, CBOT wheat futures. [3] Historical call implied volatilities for first generic futures contracts. For copper, COMEX copper futures.

Sources: Bloomberg; Datastream. Graph 5

had little impact. The deteriorating political situation in Libya led to more than half of the country's oil production being shut down. This resulted in sizeable jumps in oil spot and futures prices, with the spot price reaching levels not seen for two years. The surge in oil prices was seen as a threat to global growth, causing non-energy commodity spot prices to decline and implied option volatilities for oil and other commodities to shoot up.

Monetary policy in focus as inflation pressures mount

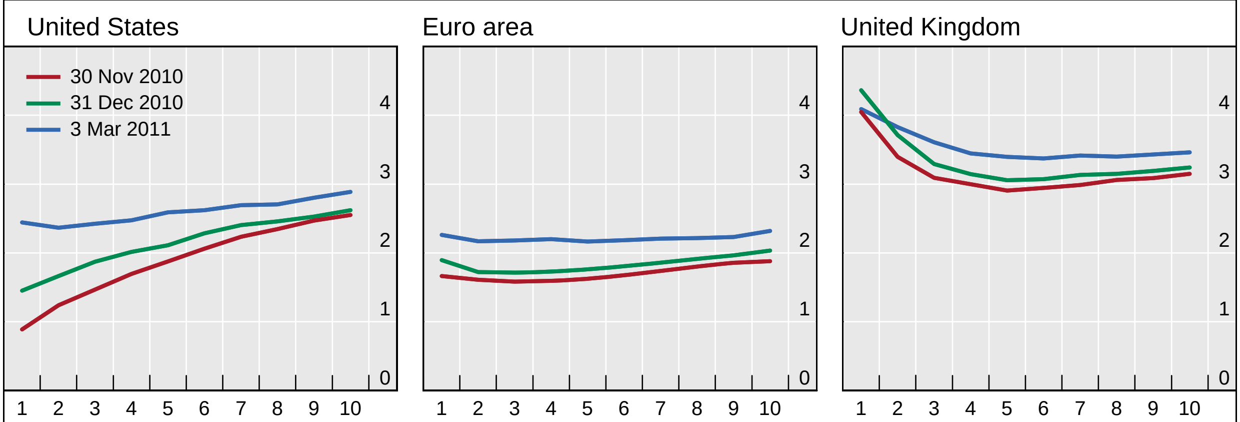
Investors price in higher inflation …

With food and commodity prices surging and headline inflation picking up, investors began pricing in higher inflation rates in major mature economies, particularly in the near term. Inflation swap rates (ie break-even inflation rates traded in swap markets) shifted gradually upwards in recent months. While these movements were largely uniform across maturities for euro area and UK inflation swap curves, the US curve shifted upwards substantially more at the short than at the long end (Graph 6). With inflation pressures rising, investors increasingly focused on the likelihood and timing of monetary policy tightening.

The rise in inflation swap rates coincided with upticks in headline inflation measures in the United States and the euro area, even as core inflation remained considerably lower and more stable (Graph 7). This was no surprise, as inflation swaps are indexed to headline consumer price indices (the retail price index (RPI) for the United Kingdom), and consumer prices tend to react relatively quickly to swings in prices of commodities and food. Core price indices, on the other hand, tend to take out food and energy prices, ie precisely those components which have experienced the most rapid increases. The greater stability of longer-dated US inflation swap rates suggests that, at least for now, much of the recent rise in headline inflation rates was perceived by investors as largely a one-off increase, rather than the beginning of a

The term structure of inflation swap rates[1]

In per cent

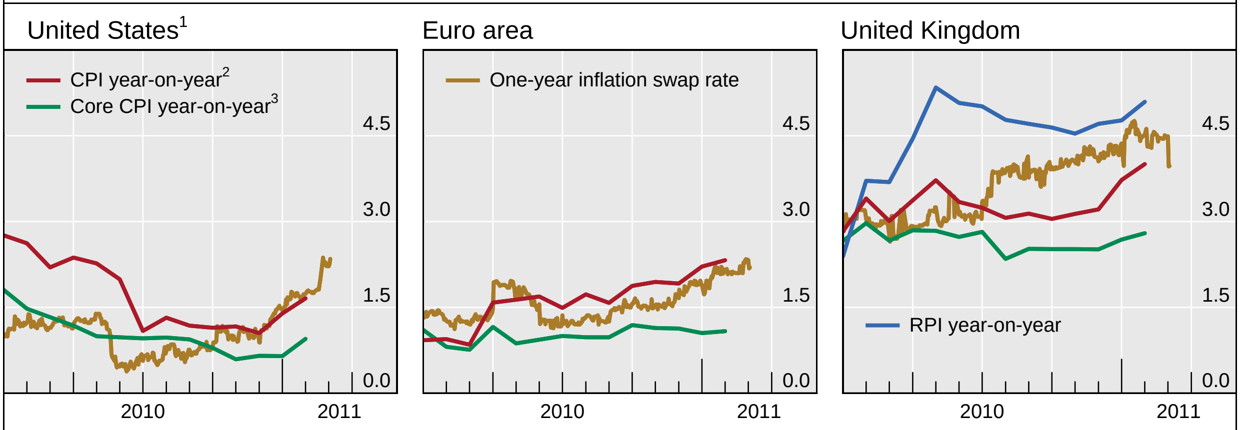


[1] Horizontal axis indicates the horizon in years. Inflation swaps pay the inflation rate (for a specific price index) accrued on a notional value over the relevant maturity of the swap against a fixed payment, which reflects the inflation swap rate (this refers to the most liquid type of contract, zero coupon inflation swaps). The inflation swap rate therefore represents a traded break-even inflation rate.

Sources: Bloomberg; BIS calculations. Graph 6

Inflation measures and near-term break-even rates

In per cent



[1] Data seasonally adjusted. [2] For the United States, CPI urban consumers; for the euro area, Eurozone HICP all items; for the United Kingdom, CPI EU harmonised. [3] For the United States, CPI consumers excluding food and energy; for the euro area, Eurozone core MUICP; for the United Kingdom, Eurostat UK core HICP.

Sources: Bloomberg; BIS calculations. Graph 7

persistent rise in US inflation.[2] It remains to be seen whether these expectations turn out to be justified.

The recent indications of rising short-term inflation expectations were generally not accompanied by signs of higher uncertainty about near-term inflation developments. Implied inflation volatility, backed out from two-year options on inflation, remained broadly stable for the United States and the euro area, even as two-year inflation swap rates rose markedly (Graph 8, left-hand and centre panels).[3] The United Kingdom was an exception, with signs of rising implied volatility in recent months indicating that investors were becoming more uncertain about the likely path of inflation over the next couple of years (Graph 8, right-hand panel).[4] This coincided with a gradual rise in the two-year UK inflation swap rate to above 4%, and with the release of data showing UK CPI inflation rising to 3.7% in December 2010.[5] Although a non-trivial part of this increase was due to the recent VAT hike, the heightened near-term uncertainty may suggest investor wariness of a persistent overshoot of the 2% CPI inflation target. News that the UK economy unexpectedly

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[2] See also the article by Gerlach et al in this issue of the *Quarterly Review*, which examines various measures of inflation expectations since the financial crisis, but only up to January 2011.

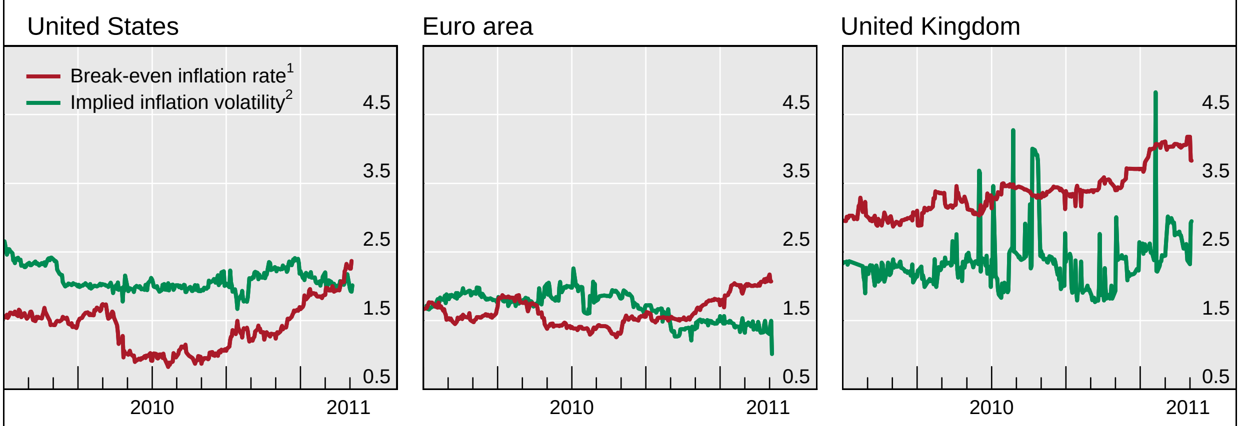
[3] Longer-term implied inflation volatilities have also remained fairly stable in recent months; see the article by Gerlach et al in this issue of the *Quarterly Review*.

[4] It also appears that UK implied inflation volatility is more volatile than US or euro area implied volatility. This may, however, reflect greater illiquidity in the UK segment of the inflation derivative market rather than structurally higher volatility of volatility.

[5] The RPI, which has a different coverage from the CPI, including with respect to mortgage and housing costs, rose to 4.8% in December.

Two-year break-even inflation rates and implied volatilities

In per cent



[1] Based on two-year inflation swap prices. [2] Backed out from two-year inflation cap prices, using the model of F Black, "The pricing of commodity contracts", *Journal of Financial Economics*, 3, 1976, pp 167–79, assuming a flat term structure of implied forward volatilities in the pricing of the series of caplets embedded in the cap.

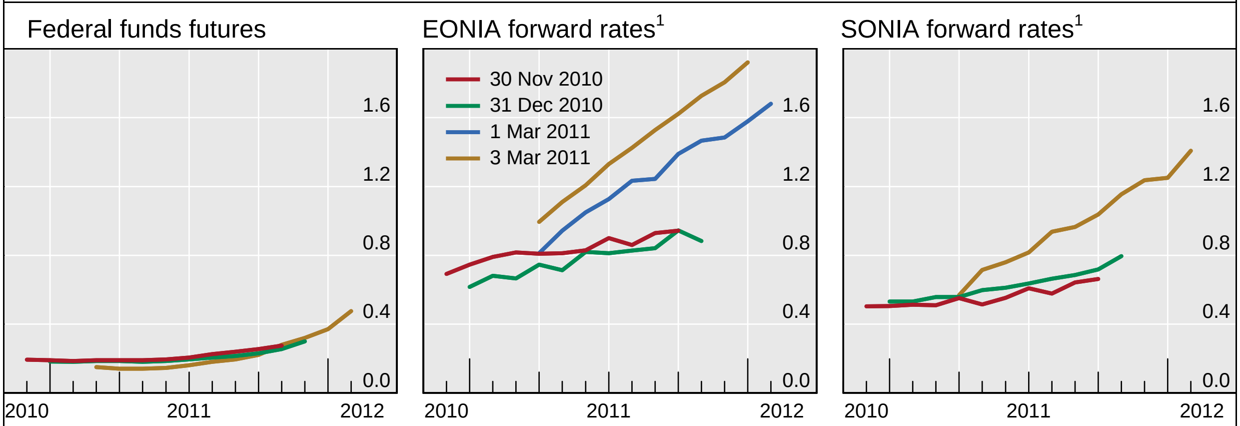
Sources: Bloomberg; BIS calculations. Graph 8

contracted by 0.5% in the fourth quarter of 2010 further complicated the monetary policy outlook.[6]

... and tightening of monetary policy ...

In line with signs that the recovery was gaining traction and with expectations of rising inflation in advanced economies, investors began to bring forward expected increases in policy interest rates, at least for the euro area and the United Kingdom (Graph 9, centre and right-hand panels). This contrasted with developments throughout much of 2010, when the expected timing of first rate hikes had repeatedly been pushed further into the future. By late February, implied forward interest rates indicated that the first UK and euro area tightening moves were expected around mid-2011, whereas in late 2010 they had pointed to first rate hikes only in 2012. This shift was consistent with

Implied forward interest rates



[1] One-month rates implied by overnight index swaps.

Sources: Bloomberg; BIS calculations. Graph 9

[6] The contraction was partly due to negative shocks to construction and services as a result of severe winter weather conditions in late 2010.

the recent rapid widening of the gap between consumer price indices and the price stability objectives of the ECB and the Bank of England. Implied euro area forward rates shifted further upwards on 3 March, as ECB President Trichet unexpectedly hinted that a rate hike was close at hand (Graph 9, centre panel). Meanwhile, US policy rates were, as before, priced in to start rising in the first half of 2012 (Graph 9, left-hand panel).

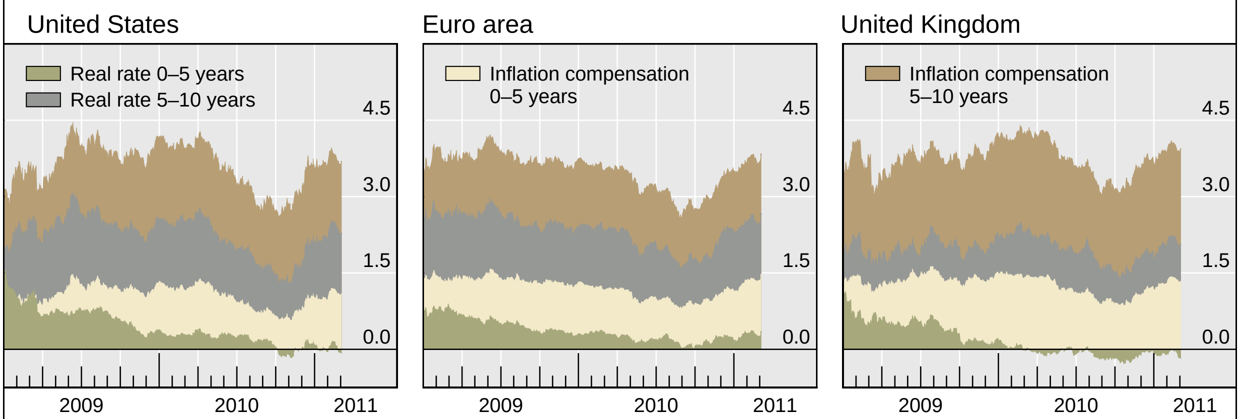
… thus driving up bond yields

The combination of a stronger recovery, rising inflation expectations, and a resulting pickup in the anticipated pace of monetary policy tightening pushed long-term government bond yields higher across major mature economies. Between end-November 2010 and early March 2011, 10-year nominal bond yields (zero coupon) rose by around 55 basis points in the euro area,[7] by almost 50 basis points in the United Kingdom and by 65 basis points in the United States. In line with the evidence from inflation swap markets, a large part of these increases was due to rising inflation compensation, especially in the near-to-medium term – up to five years ahead – while the component due to inflation compensation between five and 10 years ahead was smaller (Graph 10). For the United States, this longer-term inflation component was actually negative, albeit small. The increase in the US 10-year yield was due in roughly equal parts to inflation compensation up to five years ahead and to rising real yields between 5 and 10 years ahead. This was in line with the perceived pickup in economic activity and with investors pricing in higher real yields in anticipation of only a very gradual normalisation of US monetary policy rates. The fact that the real rate rise was seen in the five- to 10-year segment suggests that this process was expected to take some time.

In late February, flight-to-safety flows resulting from political unrest in North Africa and the Middle East put some downward pressure on bond yields in major mature economies.

Decomposition of 10-year government bond yields[1]

In per cent

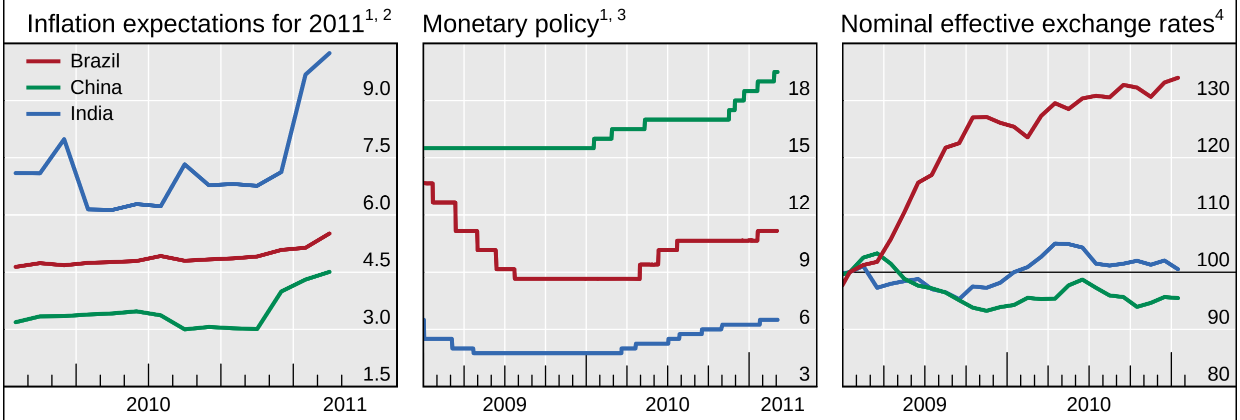


[1] Contribution to 10-year nominal yield from real yield and inflation compensation over 0–5 years and over 5–10 years. All rates are zero coupon rates.

Sources: Bloomberg; national data; BIS calculations. Graph 10

[7] This refers to French government bond yields.

Selected major emerging market economies



[1] In per cent. [2] Based on survey data from Consensus Economics. [3] For China, reserve requirement ratio; for India, repo rate; for Brazil, SELIC overnight interest rate. [4] 1 January 2009 = 100.

Sources: Bloomberg; © Consensus Economics. Graph 11

Further policy tightening in emerging markets

Meanwhile, authorities in major emerging market economies continued to take gradual steps to tighten monetary policy as inflationary pressures there intensified. These pressures resulted both from the brisk pace of economic growth – much higher than in mature economies – and from the greater importance of rising food and commodity prices for consumer price inflation in emerging economies. Among the largest economies, inflation expectations rose notably in China, and climbed further in India (Graph 11, left-hand panel). In response, the People's Bank of China hiked the reserve requirement by 50 basis points in January and again in February. These increases represented the seventh and eight tightening moves since the beginning of 2010, bringing the ratio to 19.5% (Graph 11, centre panel). The bank also raised key policy rates by 25 basis points in December 2010 and February 2011. Citing the "unacceptably high" rate of inflation, the Reserve Bank of India raised the repo rate by a further 25 basis points to 6.5%, making the cumulative increase 175 basis points since March 2010. The Central Bank of Brazil tightened policy too, increasing the SELIC interest rate to 11.25% in January to try to bring inflation towards the bank's target. These interest rate hikes in major emerging market economies have also resulted in higher real policy rates over the past few months (at least as proxied by nominal policy rates less actual, contemporaneous inflation). However, while the Brazilian real rate is relatively high (around 5%), real policy rates in China and India are still negative.

With interest rates on the rise, exchange rates continued to be subject to upward pressure in major emerging economies (Graph 11, right-hand panel). Many countries continued to rely on reserve accumulation in order to resist rapid nominal exchange rate appreciation.