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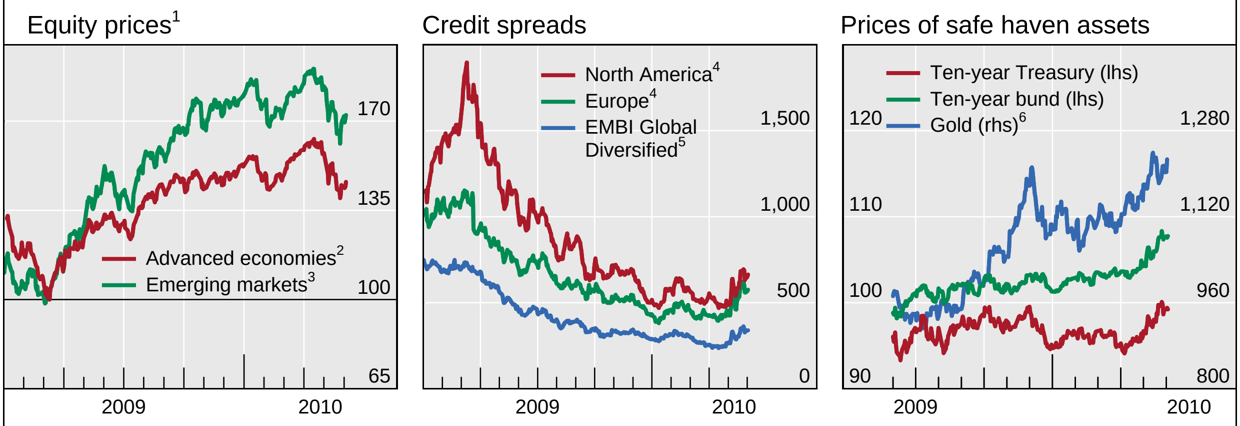
Overview: fiscal concerns shatter confidence

Global financial markets were highly volatile from mid-April to early June as fiscal concerns and the risk of weaker growth caused investor confidence to deteriorate rapidly. Investor worries about unsustainable fiscal positions crystallised around the problems of Greece and other euro area sovereigns. Faced with growing uncertainty, investors cut risk exposures and retreated to traditional safe haven assets. The announcement of a significant European rescue package bought a temporary reprieve from contagion in euro sovereign debt markets, but could not allay market concerns about the economic outlook. Instead, the flight from risky assets continued, resulting in additional increases in risk and liquidity premia.

A number of developments led investors to question the robustness of global growth. In advanced economies, investors and market commentators focused on the risk that the surge of public debt could derail the economic recovery. At the same time, rising Libor-OIS spreads reflected growing concerns that the financial system is more fragile than previously thought. Economic policy tightening in China, Brazil and India, among others, fuelled doubts that emerging economies could provide the necessary global growth momentum. Market confidence was further dented by rising geopolitical risk on

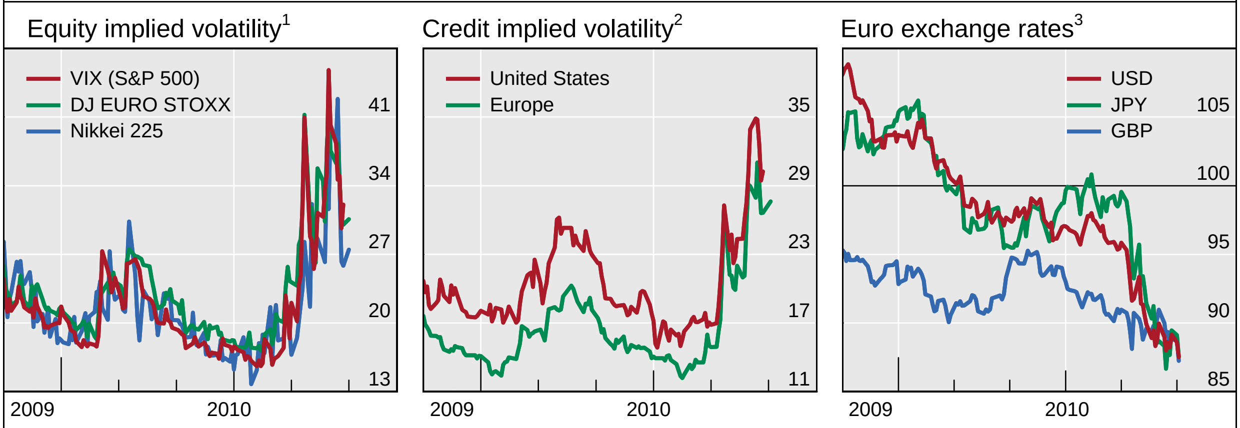
The retreat from risky assets



[1] 3 March 2009 = 100. [2] Average of S&P 500, DJ EURO STOXX, TOPIX and FTSE 100 indices. [3] Average of Asian, European and Latin American emerging market equity indices. [4] Five-year on-the-run credit default swap (CDS) mid-spreads on sub-investment grade (CDX High Yield; iTraxx Crossover) quality, in basis points. [5] Stripped spreads, in basis points. [6] Spot price per troy ounce, in US dollars.

Sources: Bloomberg; Datastream. Graph 1

Implied volatility and exchange rates



[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; iTraxx Crossover), in basis points. [3] 1 January 2009 = 100.

Sources: Bloomberg; BIS calculations. Graph 2

the Korean peninsula and Spain's second downgrade, together with the difficulties of a number of Spanish savings banks, in late May.

Over the six weeks to the end of that month, prices of risky assets fell and volatility rose. Stock markets fell in advanced and emerging markets alike, bringing global equity prices below end-2009 levels (Graph 1, left-hand panel). Corporate credit spreads, which had remained broadly stable for several months, widened in late April (Graph 1, centre panel). Faced with significantly higher uncertainty, investors increased their demand for US Treasuries, German government bonds and gold (Graph 1, right-hand panel). Implied volatilities of equity prices and credit spreads rose sharply, reaching new highs for the year (Graph 2, left-hand and centre panels). The challenging fiscal situation and uncertainty about the growth outlook for the euro area also led to a significant weakening of the euro against other major currencies (Graph 2, right-hand panel). By the end of the period, investors had become increasingly concerned about the global growth outlook and, as a result, again pushed back their expected timing for the normalisation of monetary policies in the advanced economies.

Euro area sovereign risk goes global

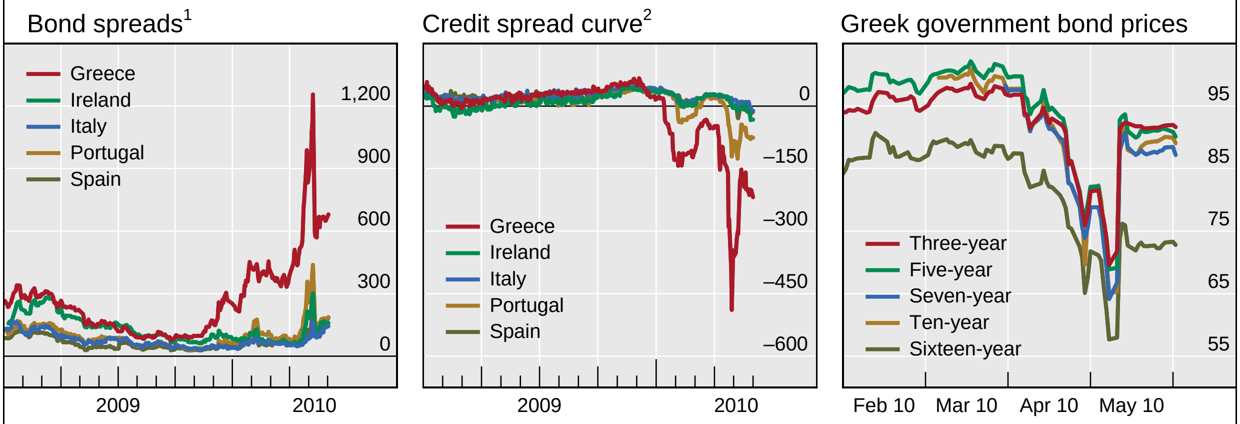
Euro area fiscal concerns rise …

Concerns about the fiscal positions of Greece and other euro area sovereigns had been on investors' radar screen since November 2009. These worries were evident in the widening of sovereign bond spreads of those countries relative to comparable German bonds (Graph 3, left-hand panel).

Growing fears about the risk of a credit event[1] were first signalled in the inversion of Greece's credit default swap (CDS) spread curve in January (Graph 3, centre panel). Two-year CDS spreads rose above spreads on

[1] This includes debt moratoriums, repudiation, restructuring and most currency redenominations as well as failures to pay.

Severe turmoil raises euro sovereign spreads



[1] Spread between five-year nominal yields and German five-year yields, in basis points. [2] Difference between 10-year and two-year CDS spreads, in basis points.

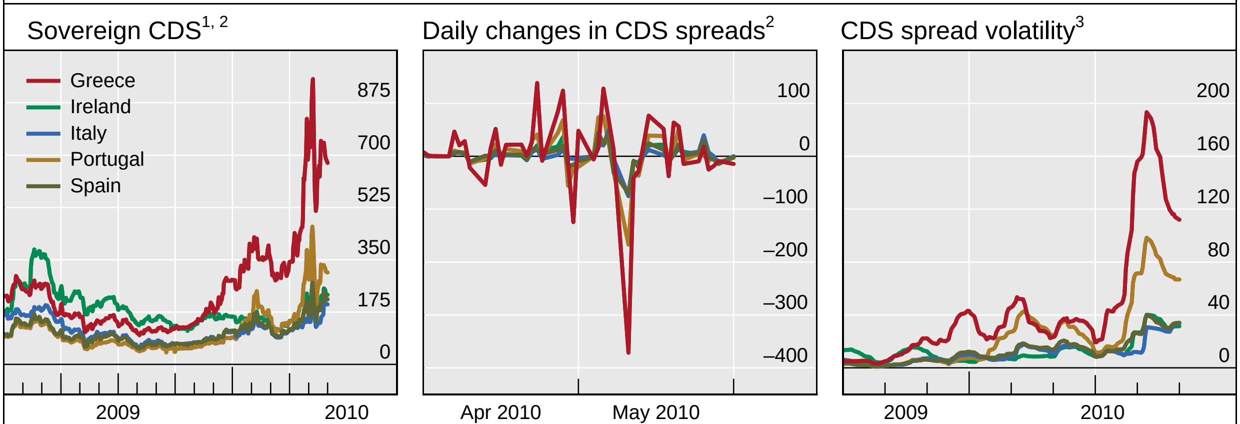
Sources: Bloomberg; Markit; BIS calculations. Graph 3

10-year CDS, consistent with the perception that the risk of a credit event was higher in the near term. At the same time, the inversion also reflected the view that, if Greece managed to meet its obligations during the next few quarters, the situation was likely to stabilise to some extent, hence resulting in lower average CDS spreads over the longer term. Consistent with this, as worries about the creditworthiness of Greece intensified in late April, the negative steepness of the Greek curve accelerated. In addition, the price of Greek government bonds fell sharply, leaving banks and other investors with large mark to market losses (Graph 3, right-hand panel).

… as Greece, Portugal and Spain are downgraded …

The catalyst for this sudden loss of market confidence was Standard & Poor's 27 April downgrade of Greek government debt to BB+ after Greece posted a worse than expected budget deficit. Portugal's simultaneous downgrade and Spain's subsequent one added to the negative sentiment. In the light of the Greek downgrade and escalating protests by the Greek public, the €45 billion EU-IMF support package announced on 11 April appeared

CDS market reaction to policy actions



[1] With old restructuring clause. [2] In basis points. [3] One-month rolling volatility, in per cent.

Sources: Bloomberg; Markit; BIS calculations. Graph 4 insufficient. Market participants questioned politicians' resolve and their ability to disburse the funds. An enlarged €110 billion package announced on 2 May also met with scepticism. Despite the ECB's decision to suspend its minimum credit rating thresholds for Greek government bonds, prices fell to distressed levels.

Euro area sovereign CDS spreads rose sharply following the 27 April downgrade. CDS spreads on five-year Greek debt rose to more than 900 basis points, similar to those of Argentina, Pakistan and Ukraine (Graph 4, left-hand panel). Portugal's sovereign CDS spreads also rose sharply, albeit to much lower levels, as investors expressed their concerns about its fiscal position. By contrast, the daily movements in sovereign CDS spreads for Ireland, Italy and Spain were more muted, consistent with differences in terms of fiscal challenges (Graph 4, centre panel). This decoupling of Greece and Portugal from Ireland, Italy and Spain was also evident in the one-month realised volatility of their CDS spreads (Graph 4, right-hand panel).

… and sovereign CDS spreads rise dramatically

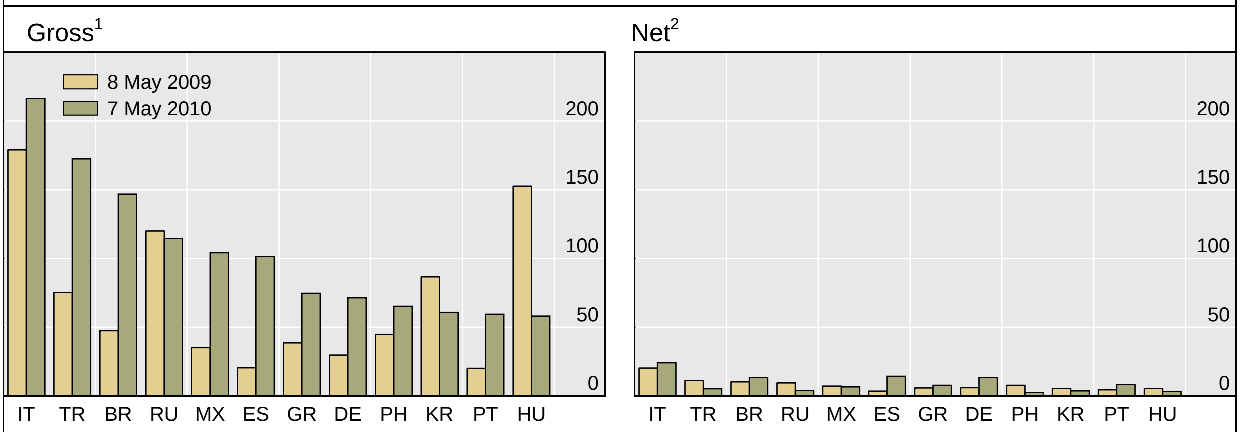
Despite the dramatic movement in euro sovereign CDS spreads, relatively little sovereign credit risk was actually reallocated via CDS markets. Even though outstanding gross volumes of sovereign CDS contracts are significant and have risen over the past year (Graph 5, left-hand panel), the net amount of CDS contracts is only about one tenth of the gross volumes (Graph 5, right-hand panel). The net amount takes into account that many CDS contracts offset one another and therefore do not result in actual transfer of credit risk.

Clear signs of contagion …

During the first week of May, the contagion from the Greek crisis quickly spread across Europe, inducing a widening of euro area sovereign CDS and bond yield spreads relative to German bunds. European equity markets fell, euro-dollar basis swaps widened, and the euro depreciated against major currencies. Market reports indicated that Portuguese, Spanish and Irish bond repo markets were becoming less liquid. With the rise of sovereign risk, market participants focused on the exposure of different banks to Greek, Portuguese

Top sovereign CDS volumes

Notional values, in billions of US dollars

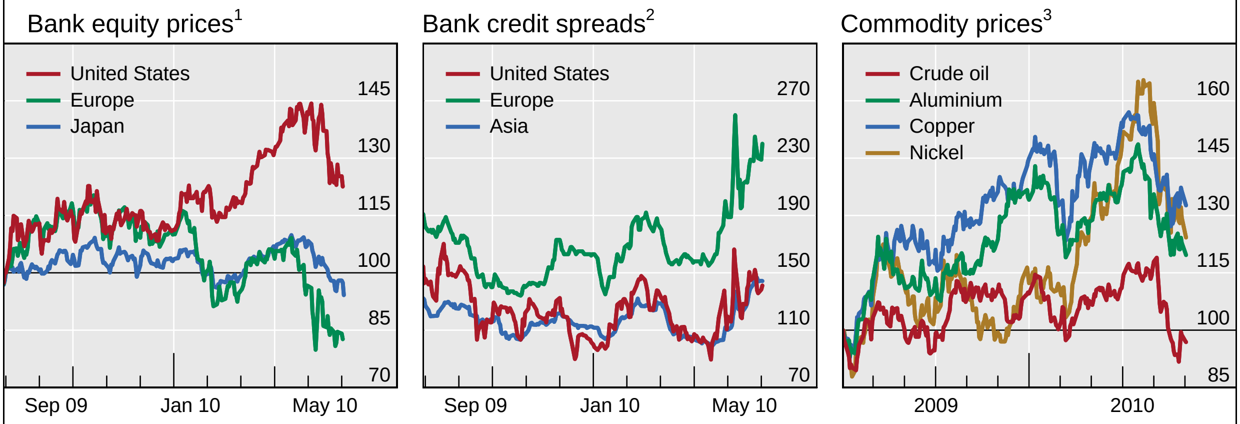


BR = Brazil; DE = Germany; ES = Spain; GR = Greece; HU = Hungary; IT = Italy; KR = Korea; MX = Mexico; PH = Philippines; PT = Portugal; RU = Russia; TR = Turkey.

[1] Sum of CDS contracts bought or sold for all warehouse contracts in aggregate. [2] Sum of net protection bought by net buyers.

Source: Depository Trust & Clearing Corporation. Graph 5

Sovereign risk goes global



[1] S&P 500, DJ EURO STOXX and TOPIX; in local currency; 31 July 2009 = 100. [2] Equally weighted average senior five-year CDS spreads for the banking sector. [3] 1 July 2009 = 100.

Sources: Bloomberg; Datastream; I/B/E/S; JPMorgan Chase; Markit. Graph 6

or Spanish sovereign debt (see pages 18–21 in this issue).

… from euro area to global markets

By the end of that week, the impact had spread beyond Europe, causing a sell-off in global equity and commodities markets. US stock markets fell 6.4% over a five-day period that included an intraday fall of 8.5%, possibly caused by a technical glitch in computer-driven trading. Equity markets in Europe and Asia dropped by similar amounts. Bank stock prices tumbled and CDS spreads widened sharply in the United States, Europe and Asia (Graph 6, left-hand and centre panels). The S&P GSCI Spot Index for commodities was down 8.5% on the week, led by falls in oil and copper (Graph 6, right-hand panel).

Continued policy tightening in China added to investor concerns about the downside risks to global growth. The Shanghai Composite Index slumped further in mid-April after the Chinese government announced new measures to cool the property market. Chinese equities dropped by almost 5% on 19 April, the first trading day after the announcement, while the property sub-index tumbled by almost 7%. On 2 May, the People's Bank of China increased its reserve requirement ratio by 50 basis points, the third such move this year. Such tightening steps, in combination with worries about developments in Europe, China's biggest export market, contributed to the 17% fall in the Shanghai Composite Index between mid-April and mid-May.

Investors cut risk exposures …

In response to greater global uncertainty, investors cut risk exposures and moved into safe haven assets. Gold soared above $1,200 per ounce, while bond investors moved out of most euro sovereign bonds into the relative safety of German and US government bonds. Despite the uncertainty surrounding the UK election on 6 May, gilt yields were relatively stable. The Swiss franc rose sharply while the euro fell to an eight-year low against the yen and a four-year low against the US dollar.

… and stresses re-emerge in US dollar money markets

Contagion from euro area sovereign debt markets also spilled over into interbank money markets, reviving concerns about rising counterparty risk and US dollar funding shortages. Three-month Libor-OIS spreads in the United States and euro area rose sharply, with implied forward spreads forecasting

Box 1: Back to the future? Comparing recent events with the 2007–09 financial crisis

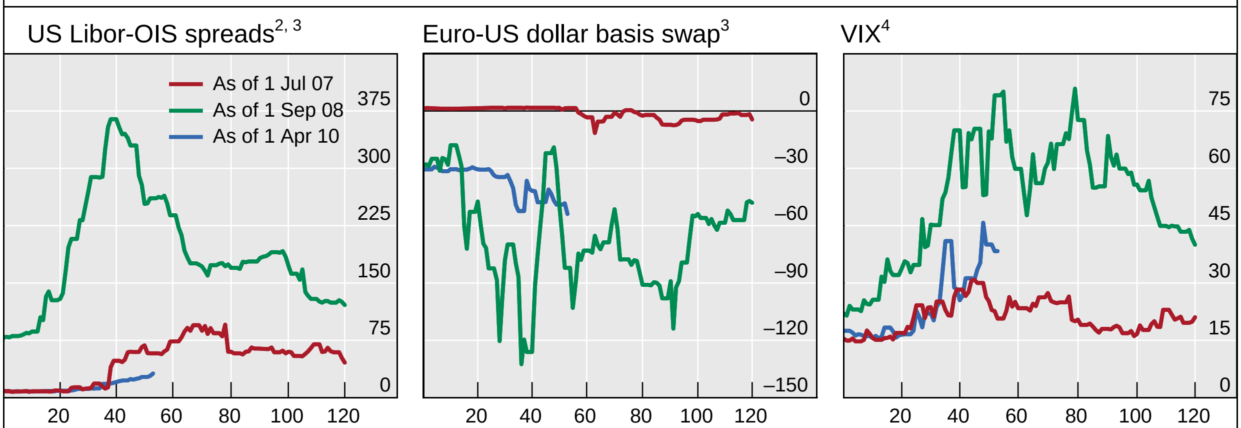
Jacob Gyntelberg and Michael R King

The swift reversal in market confidence evokes painful memories of autumn 2008, when the collapse of Lehman Brothers brought money and capital markets to a virtual standstill. In both cases market sentiment deteriorated rapidly around a trigger event, with problems in one region spreading globally through the network of interbank funding markets and counterparty credit exposures. Volatility jumped, and the prices of risky assets fell sharply as investors moved into perceived safe havens. In both episodes, central banks provided exceptional funding liquidity, and government rescue packages were subsequently announced with a view to restoring market confidence and stabilising the financial system.

While the broad outlines are similar, the Greek downgrade on 27 April and the subsequent market reaction may have more in common with the start of the subprime crisis in July 2007 than the collapse of Lehman Brothers in September 2008. That crisis began slowly with the disclosure of mounting losses on subprime mortgages and the downgrade by rating agencies of a large number of mortgage-backed CDOs. Similarly, emerging losses at several European banks were followed by a widening of Libor-OIS spreads (Graph A, left-hand panel). Over the next few months, European banks faced difficulties in funding their US dollar portfolios, as seen in the dislocation in cross-currency swap markets from September 2007 onwards (Graph A, centre panel). While equity prices continued to rise up to mid-October, implied equity market volatility increased from July onwards, as reflected in the upward trend of the VIX (Graph A, right-hand panel).

The current market stress has been associated with the same increase in equity volatility as in the second half of 2007, but Libor-OIS spreads have moved up more slowly. Despite the recent rise to around 30 basis points, three-month US dollar Libor-OIS spreads remain well below their levels from August 2007 onwards. The current rise in the VIX initially followed the July 2007 trajectory, but then jumped sharply, as it did in September 2008. While cross-currency basis swaps are signalling difficulties for banks seeking to raise US dollars, the limited participation at US dollar auctions held by the ECB, the Bank of England and the Swiss National Bank suggests that the problem is more about counterparty credit risk than access to foreign currency funding. In contrast to July 2007, the euro-US dollar basis swap began the recent period at a level suggesting that stress was already present in cross-currency funding markets. The current departure point was similar to that of early September 2008, but the spread has widened by much less this time in response to worsening market conditions.

Stress indicators across three episodes[1]



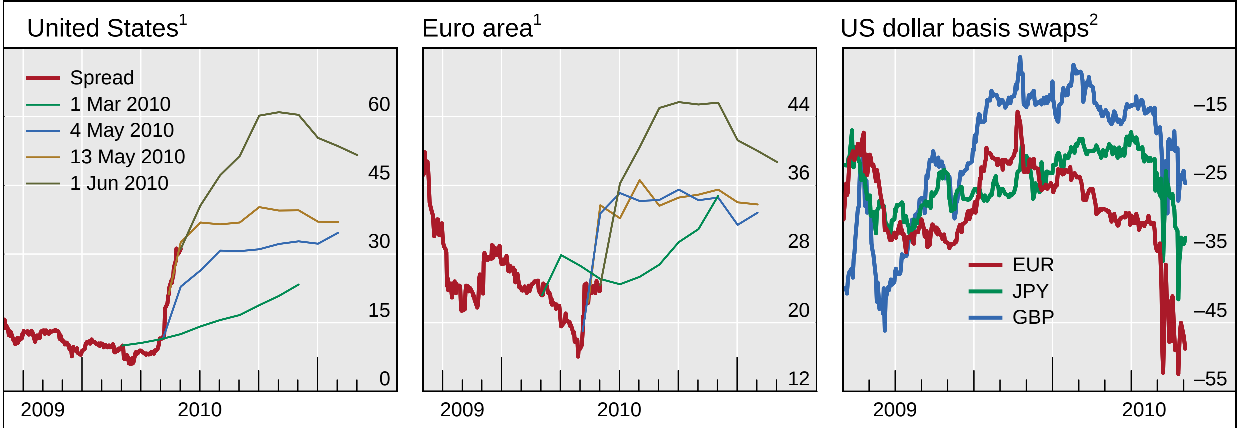
[1] The horizontal axis denotes number of calendar days. [2] Three-month Libor rate minus corresponding overnight index swap (OIS) rate. [3] In basis points. [4] VIX (S&P 500); volatility implied by the price of at-the-money call option contracts on stock market indices, in per cent.

Sources: Bloomberg; BIS calculations. Graph A

even greater increases (Graph 7, left-hand and centre panels). Spreads on USD basis swaps widened in the yen and the sterling markets, but much less

Three-month Libor-OIS spreads, implied forward spreads and basis swaps

In basis points



[1] Three-month Libor rates minus corresponding overnight index swap (OIS) rates (for the euro area, EONIA swap). Thin lines show forward spreads, calculated as the difference between three-month forward rate agreement (FRA) rates and corresponding implied OIS rates, as at the dates indicated. [2] One-year basis swap against Libor.

Sources: Bloomberg; BIS calculations. Graph 7

than against the euro (Graph 7, right-hand panel). These price movements suggested that banks were facing difficulties in raising US dollar funding.

Anecdotal reports suggested that US money market funds were reluctant to lend to European banks. Rising Libor-OIS spreads and the dislocations in US dollar funding markets recalled events in July–August 2007, when global interbank and money markets began showing clear signs of stress (see Box 1).

Contagion temporarily halted by policy actions

EU-IMF rescue package …

Having lived through the turmoil of 2008, policymakers anticipated the end-game and took action to prevent a global confidence crisis. Their response took the form of a €750 billion rescue package announced in the early hours of Monday 10 May (see Box 2). The ECB supported this move by taking the decision to purchase euro area public and private debt securities in the secondary markets to help restore market liquidity. By early June, the ECB had reportedly purchased €40 billion of euro area government bonds, sterilised through the auction of one-week fixed-term deposits. Moreover, the ECB expanded its longer-term refinancing operations.

The Federal Reserve also took steps to relieve some of the US dollar interbank funding pressures by agreeing to reintroduce US dollar swap lines with key central banks. The US dollar swap lines were identical in size to those announced previously – $30 billion for the Bank of Canada and unlimited for the other four central banks involved – and were authorised up to the end of January 2011.

… halts contagion in the euro area …

Asset price movements immediately following these announcements initially suggested that the contagion from the Greek crisis had been halted. Euro sovereign credit spreads narrowed sharply, the euro appreciated, and global equity markets rose. Conditions in European money markets improved

Box 2: Policy actions to avoid a global confidence crisis

Michael Davies and Jacob Gyntelberg

During the past few months, there have been growing concerns about the sustainability of the fiscal positions of several euro area governments. In April, the Greek government found it increasingly difficult and costly to issue debt. The European Union and IMF announced a joint €110 billion support package for Greece on 2 May. However, during early May, market concerns about Greece and several other euro area countries intensified. This led to a sharp deterioration in financial market conditions in Europe and visible spillover to global financial markets. On 9–10 May, the European Union, IMF, ECB and other major central banks announced a series of policy actions to help restore financial market confidence.

European Union

The European Stabilisation Mechanism announced by the EU has two components. One is an additional facility which supplements the existing €50 billion EU Balance-of-Payments Facility for non-euro area members; the other is the creation of a new European Financial Stabilisation Facility (EFSF) structured as a limited liability company. Both facilities will provide funding to eligible countries that are facing external financing difficulties, usually in conjunction with international organisations such as the IMF and accompanied by economic and fiscal adjustment programmes. The €60 billion European Stabilisation Mechanism facility is available to all 27 EU member states. It will be financed by the issuance of European Commission debt, which is implicitly guaranteed by the EU budget. The expansion of this facility does not require approval by national parliaments. The €440 billion EFSF can provide loans to any of the 16 euro area countries. Indications suggest that the funding for the EFSF will be guaranteed by euro area countries on a pro rata basis, in line with their share of paid-up capital in the ECB. The guarantees must be approved by national parliaments, and will come into force when they have been approved by countries representing at least 90% of shares in the EFSF. The EFSF debt is expected to receive a AAA rating.

International Monetary Fund

The IMF has stated that it is ready to cooperate with the European Union to support the affected European countries. If requested by individual countries, the IMF will provide financial assistance on a case by case basis and in accordance with its established lending procedures, in conjunction with the new European Stabilisation Mechanism. The IMF has indicated that its financial contribution will be broadly in proportion to its recent European arrangements (about one third of total funding) and will be accompanied by economic and fiscal adjustment programmes.

Main features of the European stabilisation mechanism

	European Stabilisation Mechanism	European Financial Stabilisation Facility
Facility characteristics		
Size	€60 billion	€440 billion
Guarantee structure for debt	EU budget	Cash buffer plus 120% guarantee of each euro area countries' pro rata share of issued bonds
Approval required from national parliaments	No	Yes
Loan characteristics		
Eligibility for loans	EU countries	Euro area countries
Conditionality for borrower	Economic and fiscal adjustment programme required	Economic and fiscal adjustment programme required
Loans provided jointly with international agencies	Yes	Yes

Sources: European Commission; Council of the European Union; press reports; BIS. Table A

European Central Bank

The ECB has announced that it will purchase euro area public and private debt securities in the secondary markets to restore depth and liquidity in those markets. These purchases will be sterilised, to prevent an increase in bank reserves. As at 4 June 2010, the ECB had bought euro area government bonds worth €40 billion.

The ECB has also expanded its longer-term refinancing operations to give banks better access to longer-term funding. The regular three-month tenders (26 May and 30 June) will re-adopt the fixed rate procedure with full allotment. This means that, in each tender, the ECB will provide financial institutions with unlimited liquidity at a fixed interest rate. A six-month tender was also announced for 12 May, again at a fixed rate with full allotment.

Central bank swap lines

The Federal Reserve has reinstated temporary US dollar swap lines with the ECB, the Bank of England, the Bank of Canada, the Swiss National Bank and the Bank of Japan to help counter tightening liquidity conditions in US dollar funding markets and to prevent the spread of funding strains to other markets and financial centres. Central bank swap lines substantially lessened dislocations in cross-border funding markets in late 2008 and early 2009. The swap lines are of the same size as those announced previously – $30 billion for the Bank of Canada and unlimited for the other four central banks – and have been authorised up to January 2011. As of 2 June 2010, the ECB and the Bank of Japan had $6.4 billion (down from a high of $9 billion) and $0.2 billion of funds outstanding respectively. The Swiss National Bank and the Bank of England have held US dollar auctions but have not disbursed any funds, and the Bank of Canada has not yet held any auctions.

with the spread between EONIA and Eurepo rates narrowing, particularly for Italian government bonds. US dollar liquidity conditions eased, the euro-dollar basis swap spread narrowing by 10 basis points. Broader credit spreads also improved, with a sharp fall in European corporate CDS indices. The safe haven flows of the previous week reversed, lifting German bund and US Treasury bond yields while weakening gold and the Swiss franc.

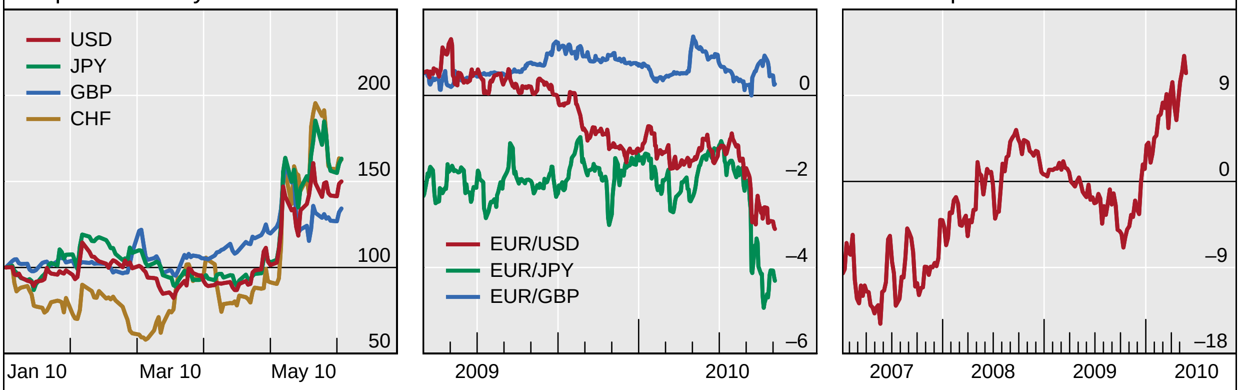
… but relief is temporary

The relief in markets turned out to be temporary, however, as investor confidence soon deteriorated on worries about the possible interactions between public debt and growth. Peripheral euro area sovereign bond spreads widened, despite bond purchases by national central banks. The euro also weakened, with volatility jumping sharply against other major currencies (Graph 8, left-hand panel). Investor concerns about a continued depreciation of the euro were reflected in the increased cost of hedging against a decline (Graph 8, centre panel) and the rapid rise in net short positions of non-commercial contracts on the euro (Graph 8, right-hand panel).

As confidence dropped, investors also scaled back their appetite for risky assets, including carry trade positions targeting currencies of commodity-exporting economies, such as the Australian dollar, the Norwegian krone and the Brazilian real. These had appreciated over the previous months on expectations that their economies would particularly benefit from a global economic recovery. In addition, these countries had begun to raise policy rates. This had led to widening interest rate differentials relative to the US dollar, the Japanese yen and the Swiss franc among others.

Despite the overall negative tone, government bond auctions by Italy, Portugal, Ireland and Spain met with strong demand in the second half of May. Also, notwithstanding apparent strains in US dollar funding markets, participation at European central bank auctions of US dollars was limited with the ECB auctioning only €1 billion in 84-day dollar loans to six counterparties.

Euro doubts escalate



[1] 1 January 2010 = 100; one-month option-implied volatility. [2] One-month, 25 delta risk reversal. [3] Difference between short and long positions, in billions of US dollars. Non-commercial contracts on the euro-dollar futures.

Source: Bloomberg.

Graph 8

Seven-day auctions by the Bank of England and the Swiss National Bank received no bids, and there was little interest in longer-term US dollar auctions held by the Swiss National Bank and the Bank of Japan. The modest participation suggests that banks were more concerned about counterparty credit risk than access to US dollar funding.

Regulatory announcements add to complexity

While investors sought to understand the rapidly changing situation in the euro area, a number of financial regulatory initiatives added to an already complex situation. On 18 May EU finance ministers agreed to impose tighter restrictions on hedge funds and private equity firms operating in Europe. Later the same day, the German financial regulator BaFin surprised markets by unilaterally announcing immediate restrictions in Germany on "naked" short selling by non-market-makers, ie short selling without holding the security.[2] The motivation for this measure was the "extraordinary volatility of debt securities of countries from the euro zone" and the significant widening of euro sovereign CDS spreads. Despite its limited reach, the ban briefly increased short selling pressure in other markets, with French, Spanish and German banks' shares falling. Then, on 20 May, the US Senate passed its financial reform bill, containing a number of measures designed to limit risk-taking by large banks.

US and euro area monetary tightening expected to be postponed

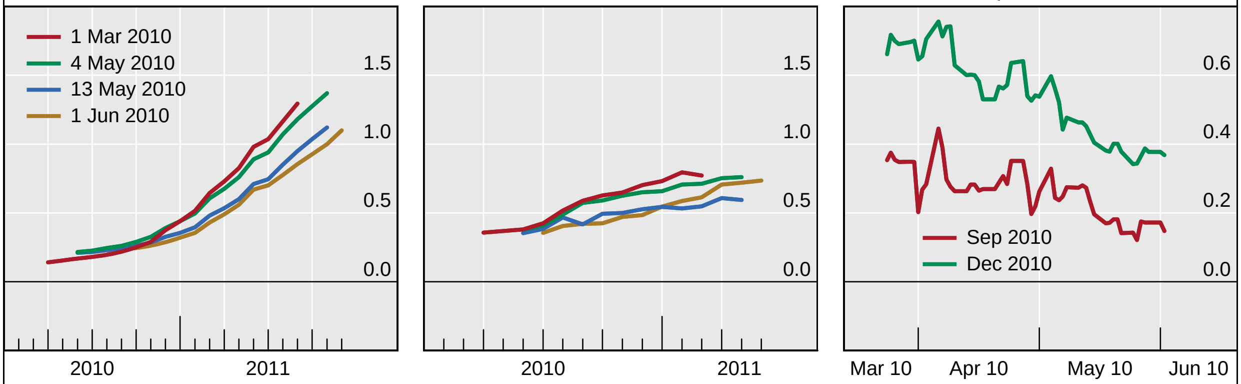
Expected time of policy tightening postponed again …

As doubts mounted about the prospects for global economic growth, market participants pushed out the expected timing of monetary tightening in the major advanced economies. In the United States, federal funds futures and options suggested that the first rate hike was not expected to occur until late in the first quarter of 2011 (Graph 9, left-hand panel), with the probability of a hike in September and December 2010 declining (Graph 9, right-hand panel). Forward

[2] The ban covered euro area government bonds, CDS and the shares of several German financial companies.

Monetary policy expectations

Federal funds futures | EONIA forward rates[1] | Fed rate hike probabilities[2]



[1] One-month rates implied by overnight index swaps. [2] Option-implied probabilities that the Federal Reserve will raise the federal funds target above the 0–0.25% range following the FOMC meeting in the indicated month.

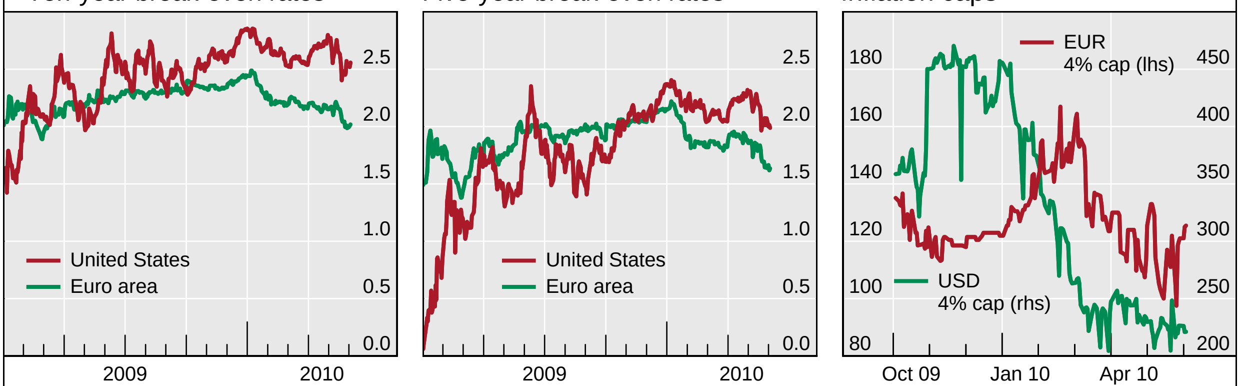
Sources: Bloomberg; BIS calculations. Graph 9

rates in Europe signalled a similar postponing of the expected first rate hike by the ECB beyond 2011 (Graph 9, centre panel). Such revisions in policy expectations in part reflected communication by these central banks that rate hikes were not anticipated in the near term, as well as investors' concerns that volatile market conditions could derail the nascent economic recovery. A further reason for the change in market expectations about monetary policy was expected fiscal consolidation in a number of countries and its possible contractionary effects.

Against this background of heightened uncertainty, market participants focused on the deteriorating financial market conditions while often ignoring positive macroeconomic news. The United States, in particular, saw upbeat news related to the employment outlook and consumer spending. The April jobs report, for example, saw US non-farm payrolls increase by 100,000 more jobs than expected to 290,000, but the S&P500 Index fell by 1.5% on the day. Similar positive news in the United States and elsewhere was often discounted or ignored by markets.

The inflation outlook

Ten-year break-even rates[1] | Five-year break-even rates[1] | Inflation caps[2]



[1] From inflation swaps, in per cent. [2] Five-year caps with inflation strike level 4%, in basis points.

Sources: ECB; Federal Reserve Bank of Philadelphia; Bloomberg; BIS calculations. Graph 10

Box 3: Higher public sector holdings of US public debt

Robert N McCauley

The Federal Reserve smoothly ended its huge programme of bond purchases when it bought its last agency mortgage-backed bonds at the end of March 2010. Ending purchases does not imply, though, that holdings no longer help keep bond yields low. Gagnon et al (2010)[1] argue that the impact depends on the stock of Federal Reserve holdings of US Treasury and agency ("public") debt, rather than on the flow of purchases. In that spirit, public debt holdings by sovereign asset managers outside the United States could have a similar impact on yields. Taken together, US government bodies and foreign official portfolios hold more than 40% of Treasury and agency securities, and they have probably absorbed over half of the net supply since mid-2008. On a duration-weighted basis, the increase has been even larger, which would amplify any impact on long-term yields.

To be sure, the motivations for the stepped-up official holdings have differed. For its part, the Federal Reserve, in conjunction with the US Treasury, has bought bonds in order to lower mortgage and other long-term yields to private borrowers. This policy interest is expected in time to abate and to reverse. Indeed, the minutes of the 27–28 April 2010 Federal Open Market Committee meeting reported majorities for a five-year bond sale programme and for timing sales after an eventual hike in the short-term policy rate. Foreign official holders have different motivations in holding US public debt and tend to behave differently over the interest rate cycle. They build up and run down their holdings of US public debt for a variety of reasons, including as a by-product of resisting currency appreciation and depreciation and as insurance against sudden calls for foreign exchange. While many central banks used their foreign exchange reserves during the crisis to support their currencies and to provide dollar liquidity to the private sector, foreign official holdings of US public debt securities reportedly rose in the years covered by the surveys of June 2008 and June 2009.

Public holdings of US public bonds

In billions of US dollars and per cent

	June 2007	June 2008	June 2009	Dec 2009	March 2010
Treasuries, outstanding	4,705	5,056	6,950	7,591	8,000
Foreign official holdings	1,611	1,910	2,624	2,705	2,707
Fed holdings	791	479	657	777	777
Agencies, outstanding	7,102	7,885	8,144	8,113	8,113
Foreign official holdings	830	1,097	829	746	719
Fed holdings	0	0	559	1,068	1,238
Agency holdings	688	854	949	925	925
Treasury holdings[1]	0	0	165	226	226
Total public debt	11,807	11,506	15,093	15,703	16,113
Foreign official holdings	2,441	3,007	3,453	3,450	3,426
Fed, agency, Treasury holdings	1,479	1,333	2,329	2,995	3,165
Total public holdings	3,920	4,340	5,782	6,446	6,592
Memo: Bank reserves at Fed	*17*	*34*	*661*	*977*	*1,051*
Memo:					
Foreign official holdings	*20.7%*	*26.1%*	*22.9%*	*22.0%*	*21.3%*
Fed, agency, Treasury	*12.5%*	*11.6%*	*15.4%*	*19.1%*	*19.6%*
Total public holdings	*33.2%*	*37.7%*	*38.3%*	*41.0%*	*40.9%*

[1] Does not include $126 billion of Treasury holdings of senior preferred stock of Fannie Mae and Freddie Mac as of end-March 2010.

Sources: Federal Reserve Flow of Funds and Department of Treasury, Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, *Surveys of foreign portfolio holdings as of June 30, 2007, 2008* and *2009* (April 2008, 2009, 2010) updated with Federal Reserve H4.1 release, monthly Treasury International Capital data and Federal Housing Finance Agency data on Treasury holdings of agency MBS. Table A

Overall, the share of US public debt held by officials has risen. Before the onset of the crisis, foreign officials and the Federal Reserve held between them about one third of US public debt securities, mostly Treasury securities. Since then, such public holdings have increased to more than 40%. The most striking development has been the increase in the share of US public debt held by the US public sector, which went up by 7 percentage points, to roughly 20%. The Federal Reserve's purchase of over $1.4 trillion in agency debt – mostly mortgage-backed securities – accounted for the bulk of this increase. By contrast, Federal Reserve holdings of Treasuries contributed little on balance over this period. The percentage share of foreign official institutions was roughly stable in the low 20% range, as a decline in holdings of agency securities appears to have been more than offset by larger holdings of US Treasury securities.[2]

The rise in the share of publicly owned US public debt understates the shift in terms of duration. The most recent survey of foreign official holdings of Treasuries shows that half mature in three years or less, with an average maturity of 48 months, slightly less than that of Treasury securities overall. Whereas traditionally the Federal Reserve had aimed for market neutrality in its Treasury holdings, in the recent bond buying, "the composition of purchases was tilted towards longer-maturity or longer-duration securities in order to enhance the portfolio balance effect and reduce longer-term interest rates" (Gagnon et al (2010, p 10)). In particular, Federal Reserve purchases of mortgage-backed securities focused on recent 4% and 4.5% paper of particularly long duration.

In sum, on the available evidence, large-scale US official purchases of agencies have raised the share of the rapidly growing US public debt in relatively concentrated public hands to more than two fifths.[3] Much of the large increase in US public debt since 2008 has found its way into official hands.

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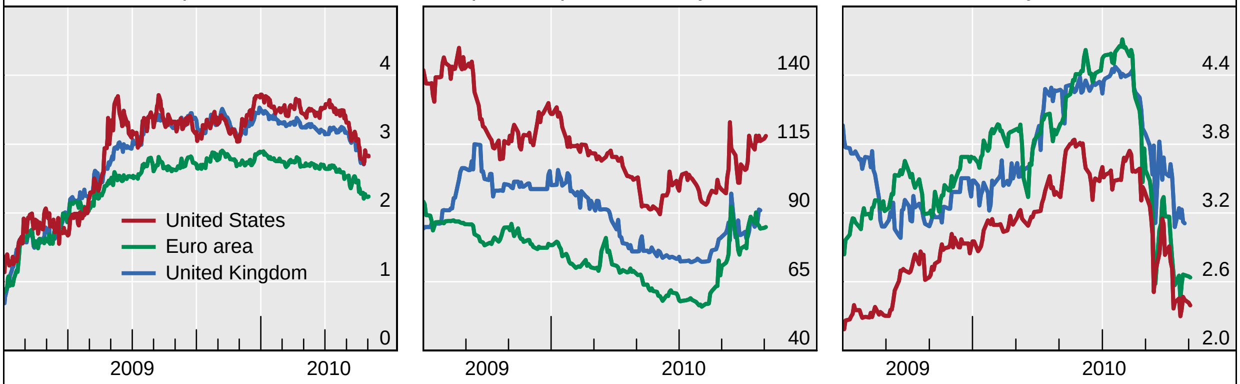
[1] J Gagnon, M Raskin, J Remaché and B Sack, "Large-scale asset purchases by the Federal Reserve: did they work?", Federal Reserve Bank of New York, *Staff Reports* 441, March 2010. [2] The table mostly relies on annual surveys of stocks, which drill down with custodians to identify foreign official holdings that monthly transactions data miss. In particular, the last surveys of June 2007, 2008 and 2009 raised the estimate of foreign official holdings by 13%, 5% and 17%, respectively. Thus the December 2009 and March 2010 estimates are likely to be understated. [3] One could view the US official purchases as entirely asset swaps, as were the Treasury purchases of agencies with the proceeds of sales of Treasury securities. Accordingly, one could include Federal Reserve liabilities to banks in the public debt (treating banks' claims on the Federal Reserve as close substitutes for their holdings of Treasury bills). In terms of the table, this would mean adding the memo item "Bank reserves at Fed" to the public debt. On this view, the increase in the US public debt would be larger since mid-2008 and the rise in the share in public hands somewhat smaller. Still, much of the large increase in US public debt would have found its way into official hands.

… as doubts about global recovery increase

Inflation expectations over this period remained well anchored in major advanced economies. In many cases, realised inflation data surprised on the downside – the United Kingdom being an exception – with US consumer prices dropping unexpectedly in April. Break-even inflation rates were broadly stable in the United States and the euro area, as indicated by the pricing of inflation swaps (Graph 10, left and centre panels). Moreover, inflation derivatives prices showed no sign of increased concern about high inflation outcomes; prices of euro area and US five-year out-of-the-money inflation caps have been stable or declining since the start of the year (Graph 10, right-hand panel). These indicators contrasted with market commentary that the ECB's decision to purchase euro area sovereign bonds might damage its inflation-fighting credibility.

With the expected timing of policy rate increases pushed further out in major developed economies, yield curves remained extraordinarily steep even as long-term benchmark yields declined on flight to safety trades (Graph 11, left-hand panel). The recent turbulence in financial markets did, however, result in greater uncertainty about future interest rates, as indicated by higher implied

Yield curve carry trade attractiveness dwindles



[1] Ten-year swap rates minus three-month money market rates, in per cent. [2] Volatility implied by three-month swaptions on 10-year swap contracts, in basis points. [3] Defined as the differential between 10-year swap rates and three-month money market rates divided by the three-month/10-year swaption implied volatility.

Sources: Bloomberg; BIS calculations. Graph 11

swaption volatilities (Graph 11, centre panel). Yield curve carry trades therefore became much less attractive from a risk-return perspective (Graph 11, right-hand panel).

US phases out exceptional policy measures

While European policymakers introduced new support initiatives, a number of other monetary authorities continued to withdraw exceptional support measures. As planned, the US Federal Reserve completed its purchases of agency mortgage-backed bonds at the end of March. Although the Fed is no longer buying bonds, there are signs that its significant holdings of public sector bonds continue to help keep bond yields low (see Box 3). With uncertainty remaining about the strength of the economic recovery, market participants were anxious about the timing and speed of possible Federal Reserve asset sales. But minutes from the April FOMC meeting indicated that asset sales would probably be gradual, starting only after the first policy rate increase.

EMEs continue tightening

While the decline in confidence further postponed the normalisation of monetary policies in most advanced economies, other countries took steps to tighten policy from April onwards. The Bank of Canada raised interest rates by 25 basis points on 1 June. Moreover, as discussed above, China raised its bank reserve requirements and took steps to cool its housing markets. The Central Bank of Brazil raised its target short-term interest rate by 75 basis points to 9.50% towards the end of April, citing upside risks to inflation. The Reserve Bank of India increased both its cash reserve ratio and its repo rate by a further 25 basis points on 20 April. Market participants expected more policy tightening across a range of emerging market economies, although uncertainty about the pace of tightening increased. On the one hand, many of these economies are facing rapid economic growth, currency appreciation and the risk of overheating in asset and property markets. On the other hand, the growth and inflation outlook has been complicated by the high volatility in commodity prices and the unpredictable effects on economic activity of the euro sovereign debt crisis.