Markets and operations

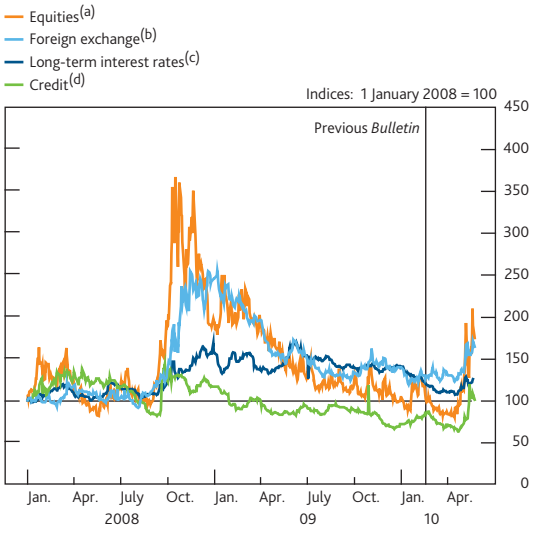
This article reviews developments in sterling financial markets since the 2010 Q1 *Quarterly Bulletin* up to 21 May 2010. The article also reviews the Bank's official operations.

Sterling financial markets

Overview

Heightened investor concern over fiscal situations in a number of countries was the dominant influence on sterling and international capital markets. Trading conditions in some government bond markets, normally viewed as safe assets, became impaired prompting increased demand for the most liquid instruments, including UK, US and German government bonds. More generally, realised and option-implied volatilities picked up sharply in a number of markets as investors retreated from risk-taking (**Chart 1**). In sterling financial markets, these developments overshadowed the impact of uncertainty associated with the outcome of the UK general election.

Chart 1 Option-implied volatilities



Sources: Barclays Capital, Bloomberg, JPMorgan Chase & Co., Thomson Reuters Datastream and Bank calculations.

(a) Simple average of the VIX, VFTSE and VSTOXX equity volatility indices.
(b) Simple average of implied volatilities from three-month options on sterling-US dollar, euro-US dollar and euro-sterling exchange rates.
(c) Simple average of implied volatilities on US, European and UK swaptions settling on ten-year swap rates, one year forward.
(d) Simple average of one to four-month implied volatilities from options on the five-year CDX and iTraxx indices.

The euro-area situation was considered sufficiently serious to prompt Member States to agree an international support package to stem the risk of contagion and underpin market liquidity. The package alleviated some near-term pressures, but worries persisted and subsequently there were sharp falls in equities, bank funding costs increased and primary capital market issuance declined.

Against that background, despite generally positive macroeconomic data, short to medium-term market interest rates in the major currencies fell. This reflected perceptions that monetary policies in the major economies would remain accommodative for longer to help support the global economic recovery.

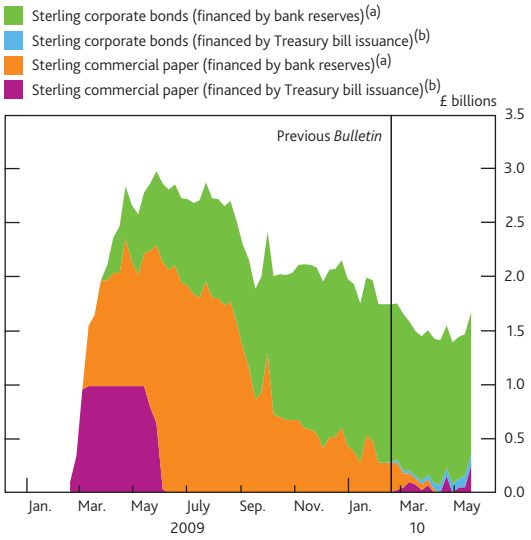
Recent developments in sterling capital markets

Monetary policy and short-term interest rates

In each of the monetary policy meetings during the review period, the Bank of England's Monetary Policy Committee (MPC) voted to maintain the stock of asset purchases financed by central bank reserves at £200 billion and the official Bank Rate paid on commercial bank reserves at 0.5%. Given the existing stock of purchased assets, together with the low level of Bank Rate, UK monetary policy remained highly accommodative.

Towards the end of the review period there was increased volatility in financial markets following renewed concerns about European sovereign risk. These heightened concerns were evident to some degree in activity in the Bank's operations. Although there were no asset purchases financed by central bank reserves, the Bank continued to purchase sterling commercial paper (CP) and operate as a buyer and seller in the sterling corporate bond market, with net purchases financed by the issuance of Treasury bills. When market conditions deteriorated in May, demand to issue CP to the Bank increased (**Chart 2**). After the end of the review period, the Bank's corporate bond auction on 25 May also saw increased appetite to sell to the Bank. In addition, demand to borrow from the Bank via its three-month long-term repo operation increased notably on 18 May (see pages 86–89 for more details).

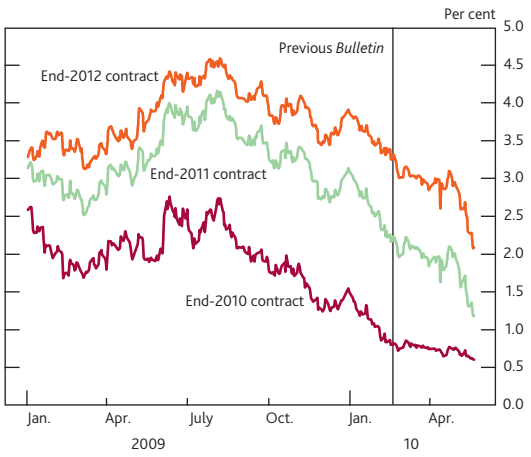
Chart 2 Corporate assets held by the Bank's Asset Purchase Facility



(a) Holdings financed by a loan from the Bank of England to the Asset Purchase Facility Fund which itself is financed by bank reserves held at the Bank of England.
(b) Holdings financed by a loan from the Debt Management Office to the Asset Purchase Facility Fund which itself is financed by UK Treasury bill issuance.

Looking ahead, market participants continued to expect UK monetary policy rates to remain low for some time. Expectations for Bank Rate for the end of 2011 and 2012, as implied by forward overnight index swap (OIS) rates, fell further as concerns about euro-area fiscal issues were perceived to delay wider economic recovery (**Chart 3**). There were similar falls in euro and US dollar OIS rates.

Chart 3 Sterling instantaneous forward interest rates derived from OIS contracts(a)

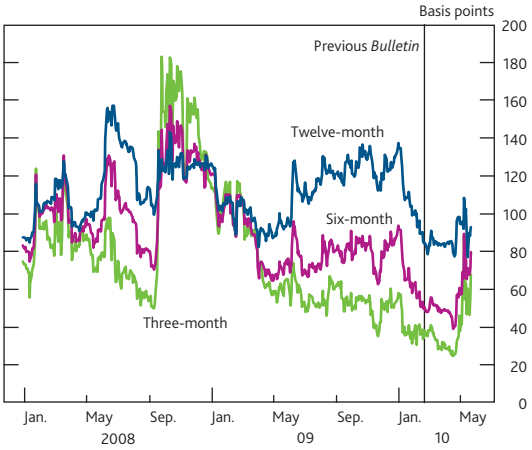


Sources: Bloomberg and Bank calculations.

(a) Instantaneous forward rates derived from the Bank's sterling OIS curve.

Market participants may also have become more uncertain about the outlook for Bank Rate, however. Information from options on sterling short-term interest rate futures indicated that implied volatility rose, largely reversing falls earlier in the year (**Chart 4**). That could have reflected a general increase in uncertainty about the global macroeconomic outlook. But it may also have been related to UK consumer price inflation outturns for March and April, which were higher than market participants had expected. Alternatively, or in addition, since these options settle on Libor (rather than OIS rates), the increase in implied volatility could have reflected uncertainty about risk premia embedded in Libor, rather than around expected future policy rates.

Chart 4 Sterling short-term interest rate implied volatility



Sources: Euronext.liffe and Bank calculations.

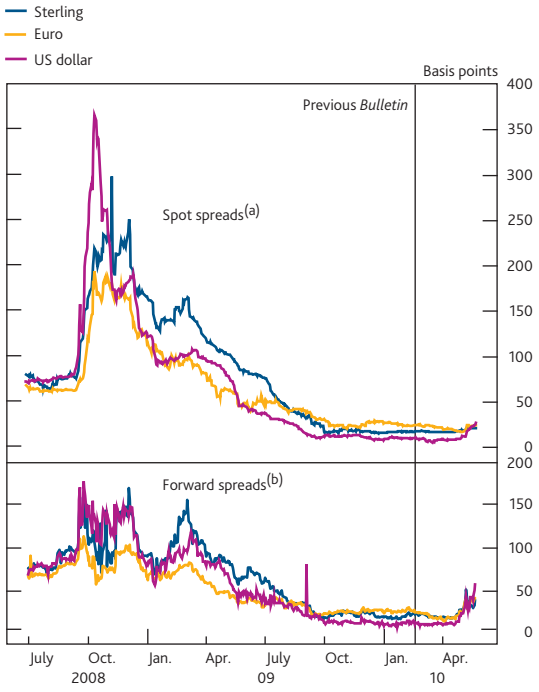
Libor-OIS spreads widened somewhat in sterling and other currencies (**Chart 5**). There was a more pronounced widening in forward spreads suggesting that market participants perceived that bank funding costs might increase further in the months ahead. Nevertheless, implied forward Libor-OIS spreads remained well below the levels of late 2008, in part because the significant injection of central bank liquidity during 2009 and early 2010 had reduced bank demand for short-maturity funding.

One reason reported by contacts for the widening in Libor-OIS spreads was increased concern about the possible implications for banks of sovereign default risks. In particular, there were worries that banks would suffer losses on their holdings of European government securities, especially those issued by Greece, Portugal and Spain. European banks' credit default swap (CDS) premia increased sharply, especially for Greek and Portuguese banks (**Chart 6**).

Accompanying higher short-term domestic funding costs for banks, there were also renewed signs of stress in cross-currency funding markets. This was especially visible in the market for US dollar funding, with an increase in the implied cost of borrowing sterling, Swiss francs or euros and swapping into US dollars via the foreign exchange spot and forward markets (**Chart 7**). The increase in cost was less than during earlier episodes of distress, such as following the failure of Lehman Brothers in September 2008. However, this might

be because European banks had a lower amount of US dollar assets to fund than previously, given asset sales and balance sheet restructuring. It might also reflect the effect of official support mechanisms that were in place.

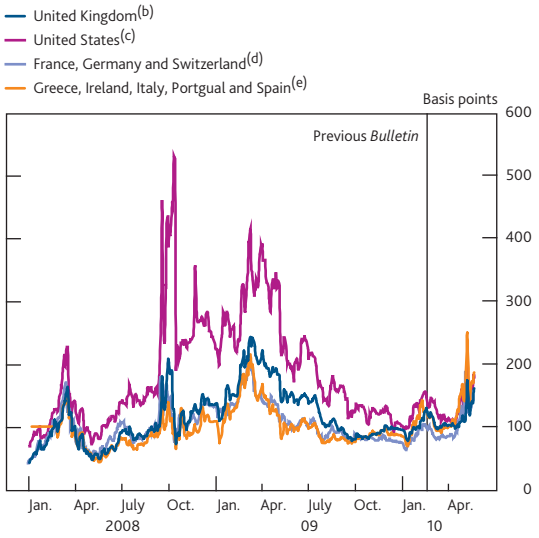
Chart 5 Three-month Libor-OIS spreads



Sources: Bloomberg, British Bankers' Association and Bank calculations.

(a) Three-month Libor-OIS spreads derived from Libor fixings.
(b) Three-month, three-month forward Libor-OIS spreads derived from forward rate agreements.

Chart 6 Selected international banks' CDS premia(a)



Source: Markit Group Limited.

(a) Unweighted averages of five-year, senior CDS prices.
(b) Average of Barclays, HSBC, Lloyds Banking Group, RBS and Standard Chartered.
(c) Average of Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase & Co. and Morgan Stanley.
(d) Average of BNP Paribas, Crédit Agricole, Credit Suisse, Deutsche Bank, Société Générale and UBS.
(e) Average of Banco Espirito Santo, Bank of Ireland, BBVA, National Bank of Greece, Santander and UniCredit.

Chart 7 Spread of foreign exchange implied cost of three-month US dollar funding over US dollar Libor(a)

Sources: British Bankers' Association, Reuters and Bank calculations.

(a) Spread of three-month US dollar Libor implied from foreign exchange forwards over actual three-month US dollar Libor. For more details on the construction of these measures see *Bank of England Quarterly Bulletin*, Vol. 48, No. 2, page 134, Chart 26 and *BIS Quarterly Review*, March 2008, pages 73–86.

The deterioration in US dollar funding markets prompted the reintroduction of arrangements between the Federal Reserve Bank of New York and other central banks(1) (including the Bank of England) to offer US dollars to their domestic counterparties. There was no use of this facility via the Bank, but contacts noted that it acted as a backstop source of US dollar funding.

Government bond markets

Against the backdrop of increased investor concerns about fiscal sustainability in some European countries, government bond markets, including the gilt market, experienced sharp price changes. Spreads between yields on certain countries' government bonds and German bunds widened sharply (**Chart 8**) and sovereign CDS premia increased (**Chart 9**). As discussed in the box on page 81, part of the increase in sovereign CDS premia might be related to the hedging activity of so-called counterparty valuation adjustment desks.

Relatedly, market functioning in a number of bond markets became impaired. In particular, bid-offer spreads for government bonds of some euro-area countries rose sharply relative to those in UK and German government bond markets (**Chart 10**).

In response to these developments, on 11 April euro-area Member States agreed to a three-year loan facility for Greece. This was followed by a broader official support package. On 2 May, the EU and IMF agreed to provide emergency loans to Greece worth €110 billion and the European Central Bank (ECB) suspended its minimum credit rating criteria for Greek government debt allowable as collateral in its operations. On

(1) Specifically the ECB, Bank of England, Swiss National Bank, the Bank of Canada and the Bank of Japan.

Counterparty valuation adjustment desks

Increased use of derivatives by financial institutions during the past couple of decades, together with a general consolidation of the international banking system has led to a structural reorganisation in the way large banks manage counterparty risk. Specifically, many banks have set up specialist trading units to measure and hedge counterparty credit risk, known as counterparty valuation adjustment (CVA) desks. This box explains the activities of CVA desks and how they may influence financial markets; particularly the market for credit default swaps (CDS).

The role of CVA desks

A commercial bank's CVA desk centralises the institution's control of counterparty risks by managing counterparty exposures incurred by other parts of the bank. For example, a CVA desk typically manages the counterparty risk resulting from a derivative transaction with another financial institution (such as entering an interest rate swap agreement).

The main role of the CVA desk is to consolidate credit risk management within the company. This can improve risk control procedures, including taking account of any offsetting positions with the same counterparty (which can reduce the need to hedge). CVA desks will charge a fee for managing these risks to the trading desk, which then typically tries to pass this on to the counterparty through the terms and conditions of the trading contract. But CVA desks are not typically mandated to maximise profits, focusing instead on risk management.

CVA desks' hedging of derivatives exposures

In a derivative transaction, a bank may incur a loss if its counterparty defaults. Specifically, if the bank's derivative position has a positive marked-to-market (MTM) value (calculated for the remaining life of the trade) when the counterparty defaults this is the bank's 'expected positive exposure'. These potential losses are asymmetric. If the value of a bank's derivative position increases (ie the bank is likely to be owed money by its counterparty), the potential loss in the event of default of the counterparty will rise. In contrast, if the value of the bank's derivative position falls such that it is more likely to owe its counterparty when the contract matures then the potential loss on the transaction is zero.

Having aggregated the risks, CVA desks often buy CDS contracts to gain protection against counterparty default. If liquid CDS contracts are not available for a particular counterparty, the desk may enter into an approximate hedge by purchasing credit protection via a CDS index and increase the fee charged to the trading desk to reflect the imperfect nature of the hedge. On occasion, when CDS contracts do not exist, CVA desks may try to short sell securities issued by the counterparty (ie borrow and then sell the securities) but this is rare.

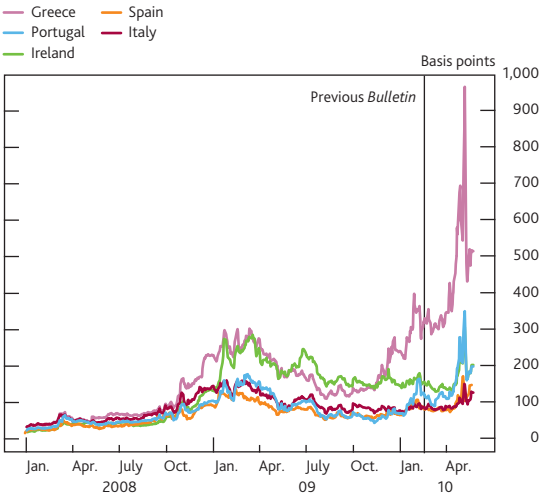
Another way to mitigate counterparty risk is for parties to a derivative trade to exchange collateral when there are changes in the MTM value of the derivative contract. The terms of the collateral agreements between the counterparties (detailed in the credit support annex in the derivative documentation) include details such as frequency of remargining. Since MTM exposure for the bank is greatest if counterparties do not post collateral, CVA desks have reportedly been influential in promoting better risk management via tighter collateral agreements in order to reduce the CVA charge.

CVA activity and the sovereign CDS market

Against the background of heightened investor awareness of sovereign risk, the cost to insure against default on government bonds through CDS has risen recently. According to contacts, increased hedging by CVA desks has been an influential factor behind these moves.

Specifically, CVA desks of banks with large uncollateralised foreign exchange and interest rate swap positions with supranational or sovereign counterparties have reportedly been actively hedging those positions in sovereign CDS markets. For example, for dealers that have agreed to pay euros to counterparties and receive dollars, a depreciation in the euro will result in a MTM profit and hence a counterparty exposure that needs to be managed. As explained in the box on pages 8–9 of the 'Markets and operations' article in the 2010 Q1 *Quarterly Bulletin*, given the relative illiquidity of sovereign CDS markets a sharp increase in demand from active investors can bid up the cost of sovereign CDS protection. CVA desks have come to account for a large proportion of trading in the sovereign CDS market and so their hedging activity has reportedly been a factor pushing prices away from levels solely reflecting the underlying probability of sovereign default.

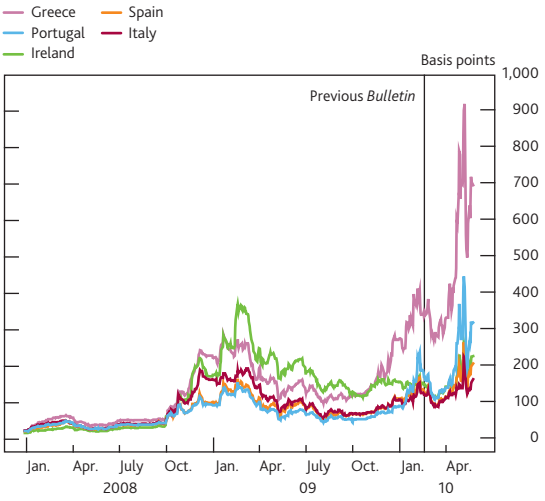
Chart 8 Selected European government bond spreads[a]



Sources: Bloomberg and Bank calculations.

(a) Spreads over ten-year German government bond yields.

Chart 9 Selected European sovereigns' CDS premia[a]



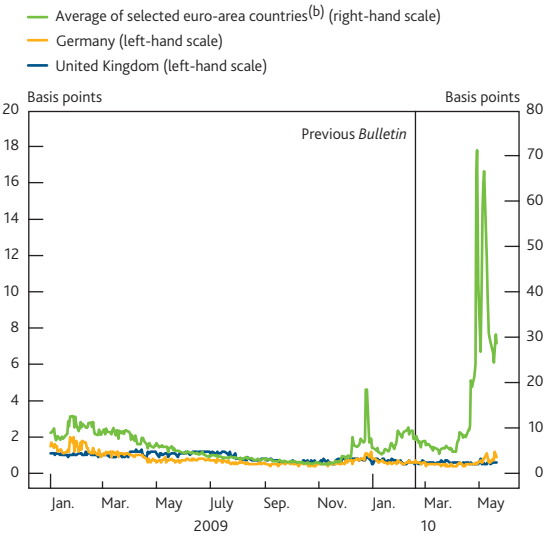
Source: Markit Group Limited.

(a) From five-year CDS prices.

10 May this was extended to an emergency funding facility of €720 billion available to all euro-area countries, and the ECB announced that it would intervene in euro-area public and private debt securities markets to 'ensure depth and liquidity in those market segments which are dysfunctional'.

Given the large projected UK fiscal deficit position, some commentators had anticipated that gilt yields would also be pushed higher as general concerns about sovereign debt sustainability rose. For much of the period, these concerns may have been exacerbated by uncertainty about the eventual outcome of the UK general election in May. In particular, survey polls indicated a reduced probability of a single-party government — reportedly seen as relevant to the UK government taking decisive action to tackle the fiscal deficit.

Chart 10 Bid-offer spreads on selected European government bonds[a]

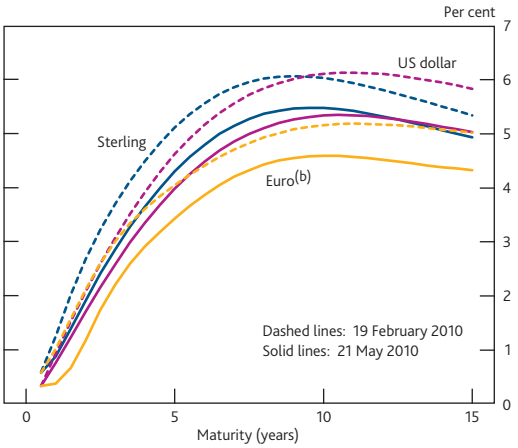


Source: Tradeweb.

(a) Bid-offer spreads on ten-year government bonds.
(b) Bonds issued by the following euro-area countries: Greece, Ireland, Italy, Portugal and Spain.

In fact the prices of gilts, as well as those of US and German government bonds, rose and their yields fell. Contacts suggested that investors sought refuge away from government bonds that they perceived to be riskier. Overall, the gilt yield curve shifted lower, with similar moves being observed for US Treasuries and French and German government bonds (**Chart 11**). The spread between gilt and bund yields was little changed (**Chart 12**).

Chart 11 International nominal government bond yield curves[a]

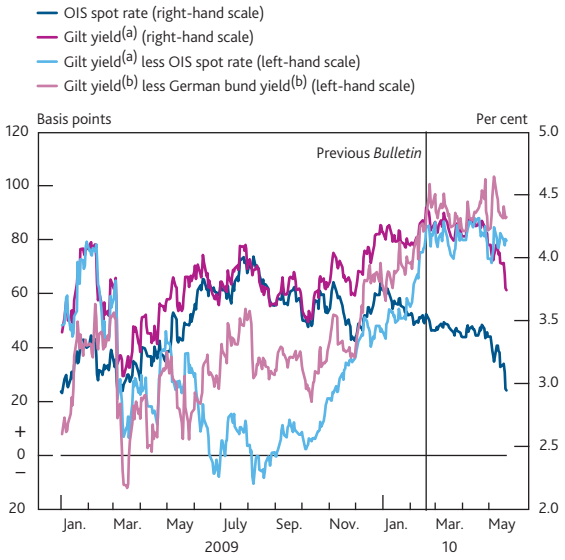


Source: Bank calculations.

(a) Instantaneous forward rates derived from the Bank's government liability curves.
(b) Derived from government bonds issued by Germany and France.

These so-called 'safe haven' flows into gilts might have been expected to reduce gilt yields relative to other benchmark sterling interest rates. However, the spread between gilt yields and equivalent-maturity OIS rates, which should in principle

Chart 12 Ten-year sterling interest rates and equivalent-maturity spreads



Sources: Bloomberg and Bank calculations.

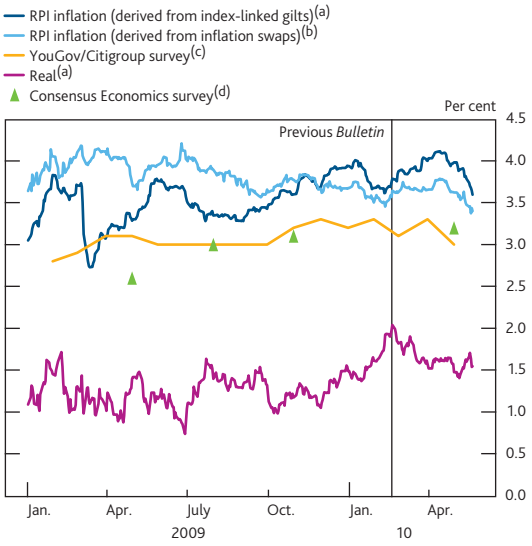
(a) Nominal sterling ten-year spot rates derived from the Bank's government liability curve.
(b) Based on ten-year benchmark government bond yields.

respond to changes in liquidity premia in gilt yields, narrowed only slightly (**Chart 12**).

A possible explanation for lower medium-horizon OIS rates is that market participants revised down their expectations for future monetary policy rates, perhaps reflecting concerns about the impact of the anticipated fiscal consolidation on economic growth. Consistent with that, and despite the large projected UK government debt position, sterling medium-term real rates remained low compared with their historical levels. Indeed, the rise in sterling five-year, five-year forward real interest rates observed in the previous review period was partly unwound (**Chart 13**). Furthermore, at ultra-long horizons, continued pension fund demand for index-linked gilts — in order to match better their liabilities — reportedly contributed in keeping real yields close to their historical lows.

During the review period, medium-term measures of sterling forward inflation rates remained broadly unchanged, although they generally fell during April and May (**Chart 13**). In principle, these moves may reflect changes in investors' expectations about future inflation and/or their required compensation for uncertainty around future inflation. However, contacts reported that sterling index-linked gilts did not benefit from increased investor demand to the same degree as conventional gilts. That would have had the effect of lowering measured forward inflation rates. An alternative indicator of longer-term expected future inflation is provided by surveys, which on the whole remained broadly stable (**Chart 13**).

Chart 13 Sterling five-year real interest rates and inflation five years forward and long-run inflation expectations

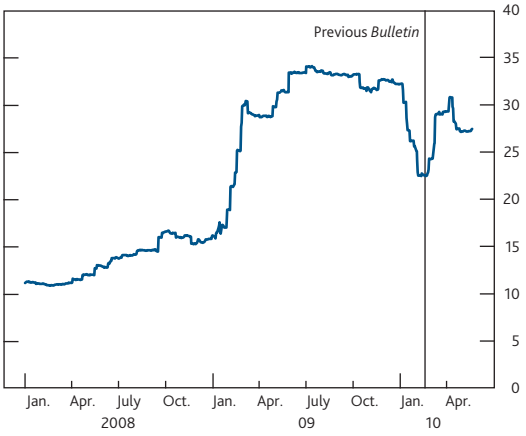


Sources: Bank of England, Consensus Economics and YouGov/Citigroup.

(a) Derived from the Bank's government liability curve.
(b) Derived from the Bank's inflation swap curve.
(c) YouGov/Citigroup survey results of long-term public inflation expectations for five to ten years ahead.
(d) Consensus Economics survey results of economists' expectations for RPIX inflation.

Uncertainty about future inflation might be reflected in the prices of options that pay out if nominal interest rates (which encompass compensation for future inflation) rise significantly. Indeed, the skew of the implied distribution of future long-term interest rates, as derived from swaption prices, remained elevated compared with levels in 2008 (**Chart 14**).

Chart 14 Sterling long-term interest rate skew(a)



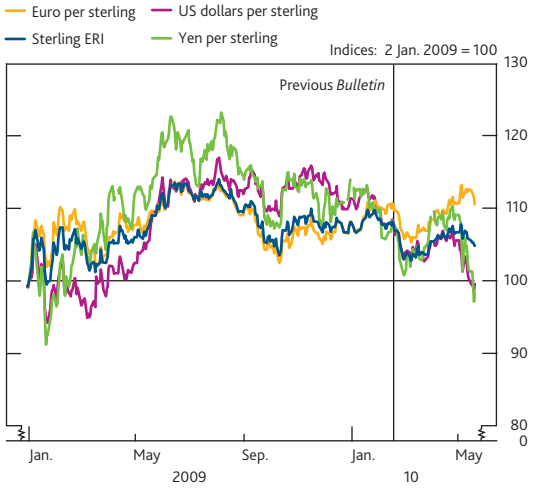
Source: Barclays Capital.

(a) Skews of five-year, five-year sterling forward payer swaptions. The so-called payer skew is the difference between the implied volatility of an out-of-the-money (in this case 200 basis points above the prevailing five-year, five-year sterling forward rate) swaption and the implied volatility of an at-the-money swaption. It captures the relative cost of upside protection against higher medium-term nominal interest rates.

Foreign exchange

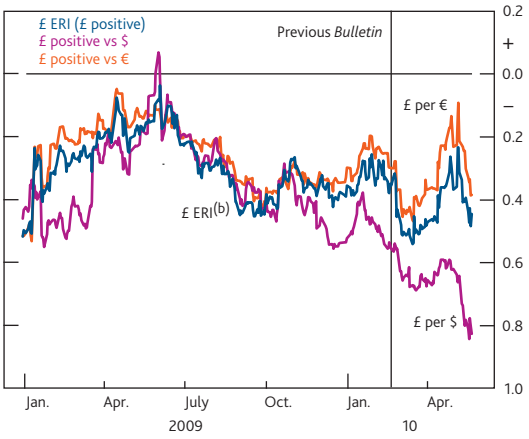
Overall, the sterling effective exchange rate (ERI) ended the period little changed, although this masked contrasting moves against different currencies (**Chart 15**). According to contacts,

Chart 15 Cumulative changes in sterling ERI and bilateral exchange rates since 2 January 2009



Sources: Bloomberg and Bank calculations.

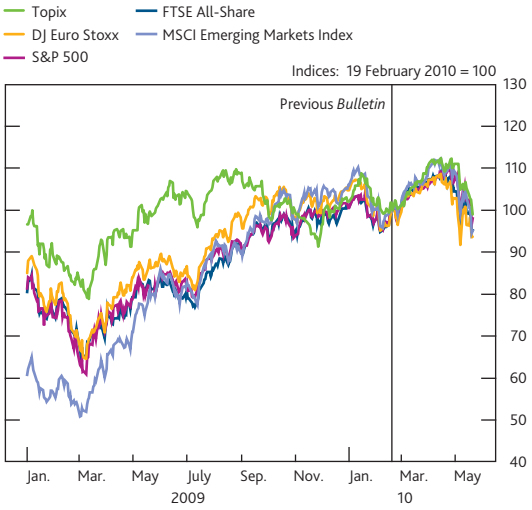
Chart 16 Three-month option-implied skewness of foreign exchange returns(a)



Sources: British Bankers' Association, ICAP and Bank calculations.

(a) Returns are defined as the logarithmic difference between the current forward rate and the spot rate at the maturity date of the contract.
(b) The simplified sterling ERI places 70% weight on the euro-sterling bilateral exchange rate and 30% weight on US dollar-sterling bilateral exchange rate.

Chart 17 International equity indices(a)(b)



Sources: Bloomberg and Bank calculations.

(a) Indices are quoted in domestic currency terms, except for the MSCI Emerging Markets Index, which is quoted in US dollar terms.
(b) The MSCI Emerging Markets Index is a capitalisation-weighted index that monitors the performance of stocks in emerging markets.

the moves in currency markets over the period were in large part attributable to renewed concerns about the fiscal position of some European countries. This led to a sharp depreciation of the euro and a general appreciation of the US dollar.

Contacts suggested that the pound benefited from a general retreat from euro-area assets, but UK-specific risks were also reported to be a concern for investors. In particular, heightened uncertainty about the outcome of the UK general election in early May might have boosted risk premia on sterling assets.

The relative balance of probabilities attached to future large upward or downward moves in the value of sterling against the euro (as inferred from option prices) ended the period broadly unchanged. But it became more negative for the prospective value of sterling against the US dollar (**Chart 16**). This implied that market participants were prepared to pay more to protect themselves against a future depreciation of sterling against the US dollar than against an appreciation. US dollar-sterling implied volatility also remained high, reflecting increased uncertainty about the future rate of exchange.

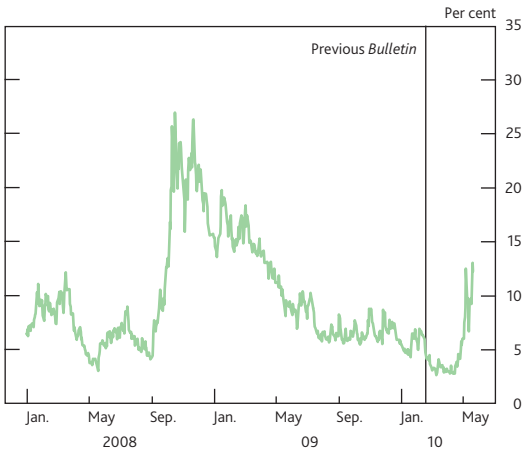
Equity markets

UK equity indices moved broadly in line with other major equity indices over recent months (**Chart 17**). In particular, global equity prices increased in the first half of the period, resuming the general upward trend in share prices that began in March 2009. However, they subsequently declined sharply in April and May, to end the period slightly lower.

According to contacts, the decline in global equity markets was triggered by the generalised rise in risk aversion and increased investor concerns about long-term economic growth prospects for countries requiring significant fiscal adjustment. The prospects of increased financial sector regulation in both the United States and Europe also contributed to falls in equity prices in the latter part of the review period.

Consistent with heightened risk aversion, implied equity volatilities derived from options for the FTSE 100 picked up sharply in May, having drifted lower earlier in the quarter. Likewise, the skew of the distribution of future equity prices implied from options prices became more negative, indicating that investors perceived that the balance of risks shifted further to the downside. Taken together, these moves suggested that the weight investors attached to the possibility of a large fall in UK equity prices increased sharply (**Chart 18**).

Chart 18 FTSE 100 option-implied probability of a 20% fall[a]

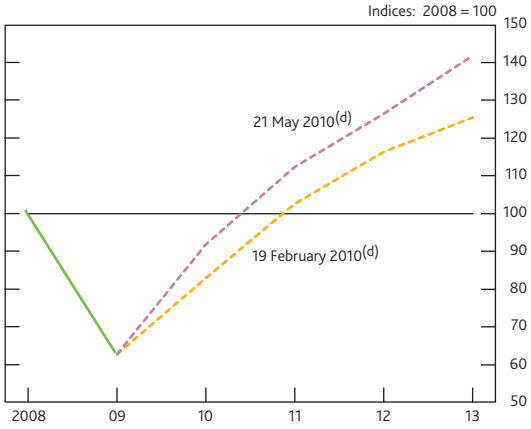


Sources: Euronext.liffe and Bank calculations.

(a) Calculated from the risk-neutral distribution of returns from three-month option prices.

Nonetheless, the implied (risk-neutral) probability of a large fall in equity prices remained lower than levels reached in late 2008. Moreover, looking over a longer time window, equity prices remained well above their levels in March 2009, consistent with a recovery in future corporate profits. Indeed, on the back of generally stronger-than-expected UK company earnings for the first quarter, the Institutional Brokers' Estimate System (IBES) survey of investment analysts continued to point to upward revisions to company earnings expectations compared with earlier in the year (**Chart 19**).

Chart 19 Actual and IBES forecasts for earnings per share for the FTSE All-Share index[a][b][c]



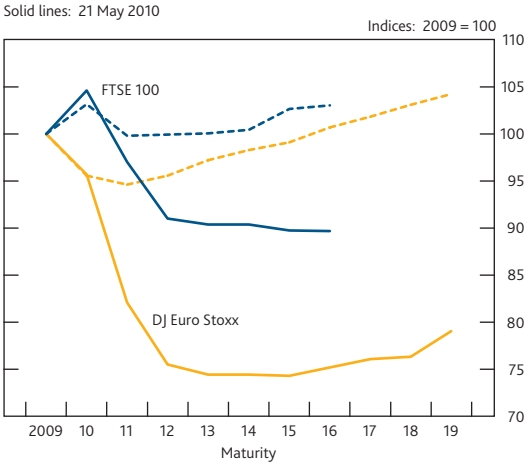
Sources: Thomson Reuters Datastream and Bank calculations.

(a) IBES uses consensus forecasts of earnings per share by sell-side analysts.
(b) Data refer to earnings per share on the FTSE All-Share index. Forecasts are denoted by dashed lines, and outturns are denoted by the solid line.
(c) The figures for a specific year relate to companies' annual results that have a year end between start-June of that year and end-May of the following year.
(d) Refers to forecast data available at the data cut-off for each *Bulletin*.

However, dividend swap prices — a market-based measure which embodies investor perceptions for future corporate earnings — for the FTSE 100 moved slightly lower over the quarter (**Chart 20**). Implied dividends on the Euro Stoxx 50 fell by substantially more (despite similarly positive European corporate earnings news). In principle, these falls in dividend swap prices might indicate that investors revised down their expectations for future corporate payouts, especially at longer horizons. But market contacts suggested that the moves were more likely driven by increases in the required compensation for uncertainty around future dividends linked to the general retrenchment from risky assets.

Chart 20 Dividend swap prices[a][b]

Dashed lines: 19 February 2010
Solid lines: 21 May 2010



Sources: Bloomberg and Bank calculations.

(a) From exchange-traded futures contracts.
(b) For more details on dividend swaps, see the box 'Dividend swaps', in the *Bank of England Quarterly Bulletin*, Vol. 50, No. 1, page 30.

Corporate credit markets

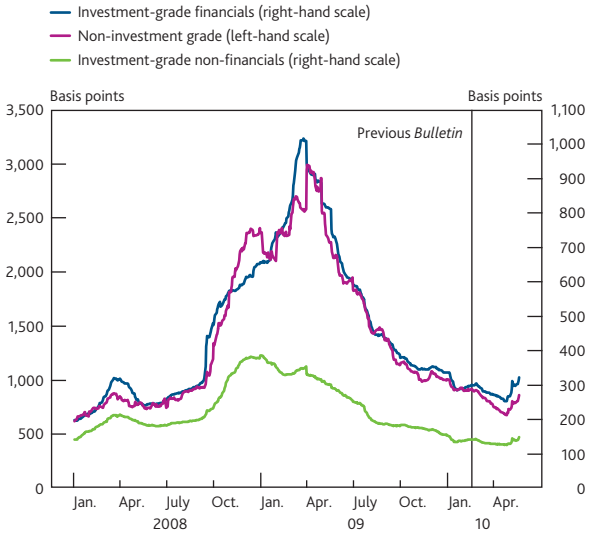
Alongside the increase in short-term funding costs for banks, the spread between yields on sterling and euro-denominated corporate bonds issued by financial companies and similar-maturity government bond yields widened (**Chart 21**). And senior debt issuance by UK banks was low relative to the amount contacts suggested might be needed to replace government-sponsored schemes due to expire over the next couple of years (**Chart 22**). Contacts thought that this partly reflected the recent general deterioration in market conditions.

Outside the financial sector, movements in corporate bond spreads were more muted although the cost of insuring against non-financial corporate bond default via credit default swaps edged up further.

Primary issuance by UK non-financial corporates also fell, particularly in May. While cumulative bond issuance in the first five months of 2010 remained well below the record 2009 levels, it was broadly in line with the average between 2005 and 2008 (**Chart 23**).

To the extent that increased volatility across financial markets discouraged investors from making primary market bond purchases, lower corporate bond issuance might indicate that

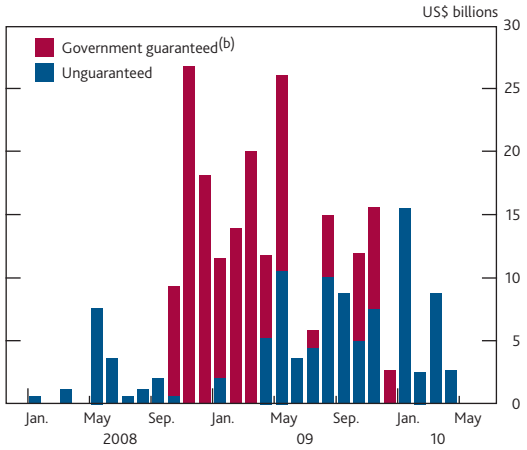
Chart 21 Sterling corporate bond spreads[a]



Sources: Bank of America/Merrill Lynch, Bloomberg and Bank calculations.

(a) Option-adjusted spreads.

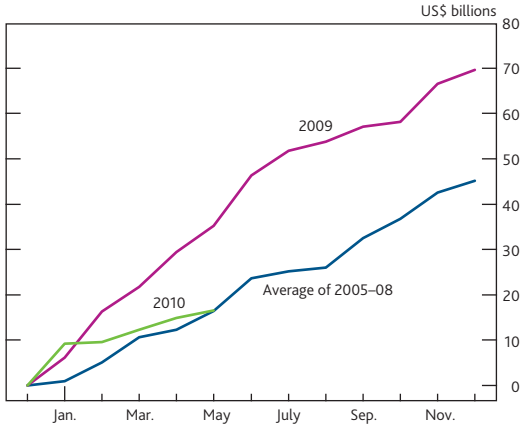
Chart 22 UK bank senior debt issuance[a]



Source: Dealogic.

(a) Issuance with a value greater than US$500 million equivalent and original maturity greater than one year.
(b) Senior debt issued under HM Treasury's Credit Guarantee Scheme.

Chart 23 Cumulative gross bond issuance by UK private non-financial corporations



Sources: Dealogic and Bank calculations.

companies were forced to hold back some of their planned 2010 issuance. But lower issuance may also be the result of corporates having pre-emptively issued some of their 2010 planned funding in 2009, in a bid to pay off outstanding bank debts and extend the maturity of their debt.

Bank of England operations

The size of the Bank's balance sheet was little changed since the previous *Bulletin*, following a period of rapid expansion.(1) The balance sheet increased from £247 billion at the end of the previous review period to £251 billion at the end of the current review period, which principally reflected a small increase in the stock of long-term repo open market operations (OMOs). The remainder of this section describes in more detail the Bank's operations over the review period.

Asset purchases(2)

In the week prior to the February 2010 MPC meeting, the Bank met the target set by the MPC of purchasing £200 billion of public and private sector assets, financed by the issuance of central bank reserves, via its Asset Purchase Facility (APF).(3) At each of the monetary policy meetings during the review period, the MPC voted to maintain the stock of asset purchases financed by the creation of central bank reserves at £200 billion. Consequently, the Bank did not undertake any APF gilt purchases over the review period.

Purchases of high-quality private sector assets financed by the issuance of Treasury bills and the Debt Management Office's (DMO) cash management operations continued, in line with the arrangements announced on 29 January 2009. **Table A** summarises operations under the APF over the review period by type of asset.

Gilts

The stock of gilts held by the APF in terms of the amount paid to sellers was maintained at £198.3 billion (**Chart 24**).(4)

Gilt lending facility

The Bank continued to offer to lend some of its gilt holdings via the DMO in return for other UK government collateral. In the three months to 31 March 2010 a daily average of £4.1 billion was lent in this way. Use of the facility continued to be generally concentrated in gilts in which the Bank holds a large proportion of the free float (the total amount of a gilt in issue less the amount held by the UK Government).

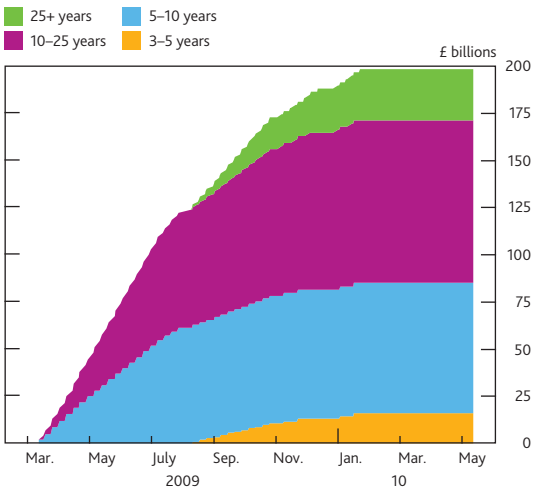
(1) For further details on the structure and evolution of the Bank's balance sheet, see 'The Bank's balance sheet during the crisis', in the 2010 Q1 *Bank of England Quarterly Bulletin*, pages 34–42.
(2) The data cut-off for this subsection is 20 May.
(3) The objectives and operation of the APF are described in more detail in the 2009 Q2 *Quarterly Bulletin*.
(4) Further details of individual operations are available at www.bankofengland.co.uk/markets/apf/gilts/results.htm.

Table A APF transactions by type (£ millions)

Week ending[a]	Commercial paper	Gilts	Corporate bond		Total[b]
			Purchases	Sales	
18 February 2010[c][d]	279	198,275	1,467		200,009
25 February 2010	25	0	3	1	27
4 March 2010	50	0	0	6	44
11 March 2010	25	0	2	67	-40
18 March 2010	0	0	5	43	-38
25 March 2010	70	0	15	4	81
1 April 2010	0	0	14	2	12
8 April 2010	0	0	20	0	20
15 April 2010	1	0	0	2	-1
22 April 2010	150	0	0	17	133
29 April 2010	0	0	0	1	-1
6 May 2010	100	0	27	1	126
13 May 2010	0	0	5	0	5
20 May 2010	250	0	12	4	258
Total financed by Treasury bills[d][e]	251	–	109		360
Total financed by central bank reserves[d][e]	–	198,275	1,310		199,585
Total asset purchases[d][e]	251	198,275	1,419		199,945

(a) Week-ended amounts are for purchases in terms of the proceeds paid to counterparties, and for sales in terms of the value at which the Bank initially purchased the securities. All amounts are on a trade-day basis, rounded to the nearest million. Data are aggregated for purchases from the Friday to the following Thursday.
(b) Weekly values may not sum to totals due to rounding.
(c) Amount outstanding as at 18 February 2010.
(d) In terms of proceeds paid to counterparties less redemptions at initial purchase price on a settled basis.
(e) Data may not sum due to assets maturing over the period.

Chart 24 Cumulative gilt purchases[a] by maturity



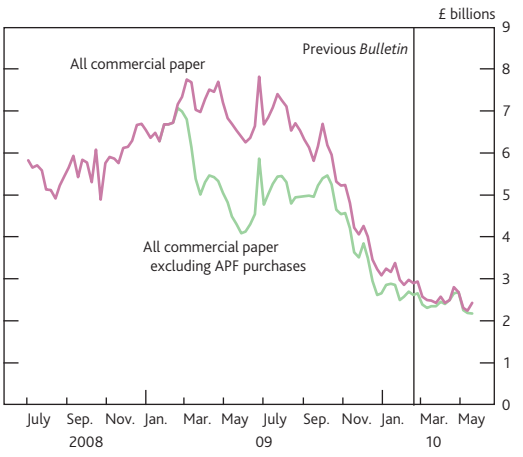
(a) Data based on settled transactions.

Commercial paper

The Bank continued to offer to purchase sterling-denominated investment-grade commercial paper (CP) issued by companies that make a material contribution to UK economic activity.

During the review period, the majority of primary spreads in the sterling CP market remained below the spreads at which the APF offers to purchase CP. Hence APF holdings of CP continued to fall from £279 million on 18 February 2010 to £251 million as of 20 May 2010. Gross purchases over the period were £671 million, compared with redemptions of £700 million. This occurred alongside a further reduction in CP outstanding for UK corporate and non-bank financial firms, which fell from £2.9 billion to £2.4 billion (**Chart 25**) as issuers continued to raise longer-term issuance in the corporate bond market and issue CP in other currencies.

Chart 25 Sterling commercial paper outstanding for UK corporates and non-bank financial firms



Sources: CP Ware and Bank calculations.

Corporate bonds

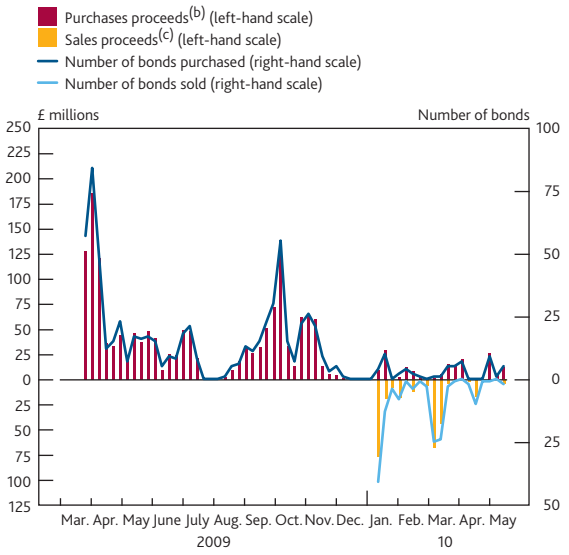
The Bank continued to offer to purchase and sell corporate bonds via the Corporate Bond Secondary Market Scheme during the review period. The Scheme aims to facilitate market-making by banks and dealers to help reduce illiquidity

premia and so remove obstacles to corporates' access to capital markets.

Activity in the Bank's auctions continued to vary with market conditions. Periods of market stress have tended to correspond with increased activity in the Bank's purchase auctions. This was noticeable on 2 October 2009 when the Bank received £332 million offers in one operation. More recently — though outside of the review period — on 25 May, and coinciding with a period of broad-based market uncertainty, the Bank received the third highest number of offers in a single auction (£276 million). Similar, if less marked, increases in activity occurred during the review period, notably in late April.

Demand in the Bank's sale auctions tended to coincide with improvements in investor sentiment, as seen in the first three weeks of March, during which the Bank sold £114 million of its portfolio (**Chart 26**). But the subsequent deterioration in market conditions, including a reduction in investor risk appetite, coincided with periods of decreased activity in the Bank's sale auctions, notably in April.

Chart 26 Weekly transactions of sterling corporate bonds(a)



(a) Data start on 26 March 2010.
(b) Weekly (Friday–Thursday) amounts in terms of the proceeds paid to counterparties, on a trade-day basis.
(c) Weekly (Friday–Thursday) amounts in terms of value at time of initial purchase, on a trade-day basis.

As of 20 May 2010, the Bank portfolio totalled £1,419 million, compared to £1,467 million at the end of the previous review period on 18 February 2010. This fall reflected the effect of corporate bond sales.

Secured commercial paper facility

The Bank continued to offer to purchase secured commercial paper (SCP) backed by underlying assets that are short term and provide credit to companies or consumers that support economic activity in the United Kingdom.(1) There has been no use of the facility to date.

Credit Guarantee Scheme

The Bank did not make any purchases of bank debt issued under the Credit Guarantee Scheme (CGS) from the secondary market, but stands ready to do so should conditions in that market deteriorate. The UK Government's 2008 CGS closed for new issuance on 28 February 2010, although institutions are able to refinance existing debt guaranteed by the Scheme.

Operations within the sterling monetary framework(2)

The Bank implements monetary policy by maintaining overnight market interest rates in line with Bank Rate, so that there is a flat risk-free money market yield curve to the next MPC decision date and by conducting asset purchases as mandated by the MPC.

During the period under review, the level of reserves was determined by (i) the stock of reserves injected via asset purchases, (ii) the level of reserves supplied by long-term repo OMOs, and (iii) the net impact of other sterling ('autonomous factor') flows across the Bank's balance sheet.

Long-term repo OMOs

Over the review period, the three-month extended-collateral long-term repo OMOs in March and April were uncovered. But the operation on 18 May received cover of 1.25 in the wake of the widespread deterioration in financial market conditions (**Table B**). This resulted in a small increase in the stock of long-term repo OMOs outstanding over the period.

Monthly repo operations at six, nine and twelve-month maturities were offered against collateral routinely accepted in the Bank's short-term OMOs and Operational Standing Facilities. In contrast to repo operations at the three-month maturity, all of these operations were covered (**Table C**). The Bank announced the introduction of a new operational design for its long-term repo OMOs in a Market Notice published on 26 May. The box on pages 90–91 outlines the key features of the new framework, the first operation under which will take place on 15 June 2010.(3)

Operational Standing Facilities

As a result of the change to remunerate all reserves balances at Bank Rate and (given the level of Bank Rate) the reduction in the rate paid on the Operational Standing Deposit Facility to zero, average use of the deposit facility was £0 million in each of the maintenance periods under review. Average use of the lending facility was also £0 million throughout the period.

(1) The SCP facility is described in more detail in the Market Notice available at www.bankofengland.co.uk/markets/marketnotice090730.pdf.
(2) This and the subsection describing other market operations cover operations from 19 February to 21 May.
(3) For further details see www.bankofengland.co.uk/markets/marketnotice100526.pdf.

Table B Extended-collateral three-month long-term repo operations

16 March 2010	
On offer (£ millions)	5,000
Cover	0.84
Weighted average rate[a]	0.557
Lowest accepted rate[a]	0.500
Tail[b]	0.06
13 April 2010	
On offer (£ millions)	5,000
Cover	0.41
Weighted average rate[a]	0.500
Lowest accepted rate[a]	0.500
Tail[b]	0.00
18 May 2010	
On offer (£ millions)	5,000
Cover	1.25
Weighted average rate[a]	0.668
Lowest accepted rate[a]	0.500
Tail[b]	0.17

(a) Per cent.
(b) The yield tail measures, in percentage points, the difference between the weighted average accepted rate and the lowest accepted rate.

Table C Long-term repo operations

	Six-month	Nine-month	Twelve-month
16 March 2010			
On offer (£ millions)	750	400	200
Cover	3.33	2.88	3.25
Weighted average rate[a]	0.539	0.577	0.685
Lowest accepted rate[a]	0.530	0.573	0.673
Tail[b]	0.01	0.00	0.01
13 April 2010			
On offer (£ millions)	750	400	200
Cover	2.10	2.19	2.38
Weighted average rate[a]	0.541	0.582	0.689
Lowest accepted rate[a]	0.531	0.566	0.686
Tail[b]	0.01	0.02	0.00
18 May 2010			
On offer (£ millions)	750	400	200
Cover	1.10	2.88	3.63
Weighted average rate[a]	0.518	0.591	0.640
Lowest accepted rate[a]	0.511	0.577	0.640
Tail[b]	0.01	0.01	0.00

(a) Per cent.
(b) The yield tail measures, in percentage points, the difference between the weighted average accepted rate and the lowest accepted rate.

Discount Window Facility

The Discount Window Facility (DWF) is a permanent facility to provide liquidity insurance to the banking system and allows eligible banks and building societies to borrow gilts against a wide range of collateral. On 6 April 2010, the Bank announced that the average daily amount outstanding in the DWF between 1 October and 31 December 2009 was £0 million.

Other market operations

Special Liquidity Scheme

The drawdown period for the Special Liquidity Scheme (SLS) closed on 30 January 2009. Although the drawdown window to access the SLS has closed, the Scheme will remain in place for three years, thereby providing participating institutions with continuing liquidity support.

As at 28 February 2010, securities with a fair value of £229 billion (2009: £245 billion) were held as collateral for Treasury bills lent under the SLS with a face value of £165 billion (2009: £185 billion).

US dollar repo operations

In response to the renewed strains in the short-term funding market for raising US dollars, the Bank, in concert with other central banks, reintroduced measures to offer US dollar financing to financial institutions, funded by a swap with the Federal Reserve Bank of New York. From 11 May, the Bank offered weekly fixed-rate tenders with a seven to eight-day maturity. As of 21 May, there had been no use of the facility.

Foreign exchange reserves

In March, the Bank issued a $2 billion three-year bond and purchased the equivalent value of principally euro and US dollar-denominated assets with the proceeds. This was the fourth bond issued by the Bank under the annual bond issuance programme.

The new bond was announced on 2 March and priced on 8 March. The transaction, which was marketed via Barclays Capital, BNP Paribas, Goldman Sachs International and JPMorgan Chase & Co., priced at a spread of zero to mid-swaps. The issue was successful, attracting a broad order book, with orders totalling $2.9 billion. It sold to investors in Asia (43%), Africa, Europe and the Middle East (36%) and the Americas (21%). As with earlier issues in the programme, central banks and official institutions were the predominant buyers (56%), with bonds being sold to asset managers (24%), and the remainder sold principally to commercial banks, insurance and pension funds (20%).

At the end of April the Bank's foreign exchange reserves comprised £3.9 billion of assets.

Capital portfolio

The Bank regularly purchases sterling bonds in the course of investing its capital and the proceeds of cash ratio deposits. These transactions are separate from the purchases of sterling bonds conducted under the APF. Over the period from 19 February to 21 May 2010, gilt purchases were made in accordance with the quarterly announcements on 4 January and 1 April. The portfolio currently includes around £3.6 billion of gilts and £0.6 billion of other debt securities.

The Bank's new indexed long-term repo operations

In October 2008 the Bank published a wide-ranging consultation paper on recent and proposed developments in its sterling market operations.(1) One of the proposals was to revise its long-term repo operations; specifically, to widen permanently the range of collateral eligible in these operations and to modify the auction design so that the quantity of funds lent against different types of collateral varied depending on the rates bid by counterparties in the auction.

Following two periods of consultation with market participants, the first auction under the revised structure is due to take place on 15 June 2010. This box explains briefly the principles underpinning the new approach and how the auctions will work in practice.

Background

As part of its existing framework of operations, the Bank has provided liquidity to the banking system via regular long-term repo operations (at three, six, nine and twelve-month maturities) since January 2006.

In addition to influencing the quantity of central bank reserves as part of the Bank's implementation of monetary policy, long-term repos can provide liquidity support to the banking system in times of stress. This latter role became particularly important at the height of the financial crisis, during which the Bank increased the size and frequency of its three-month operations and extended temporarily the range of assets that were eligible to be used as collateral in the operations. This helped meet the greater need for central bank liquidity during the global crisis and helped banks to refinance certain securities that had become illiquid. The Bank has continued to conduct auctions against an extended range of collateral in its three-month operations alongside its regular long-term repos, although it gradually decreased the size of the extended-collateral operations as bidding in these auctions reduced.

From June onwards, all of the Bank's long-term repo operations will be conducted using a revised auction design. The new design will allow the proportion of lending against different types of eligible collateral to adjust automatically in each auction depending on the bids in that auction, while ensuring that the liquidity insurance provided is appropriately priced to avoid distorting banks' incentives for prudent liquidity management. The new-style auctions, and so the provision of 'liquidity insurance' via lending against a broader range of collateral, will be a permanent part of the Bank's framework for its sterling operations.

Separately, the Bank is also mindful of the need to control the risks taken onto its own balance sheet. The article on pages 94–103 of this *Bulletin* sets out how the Bank undertakes collateral risk management in light of the expanded range of collateral accepted in these, and other, operations.

Auction design(2)

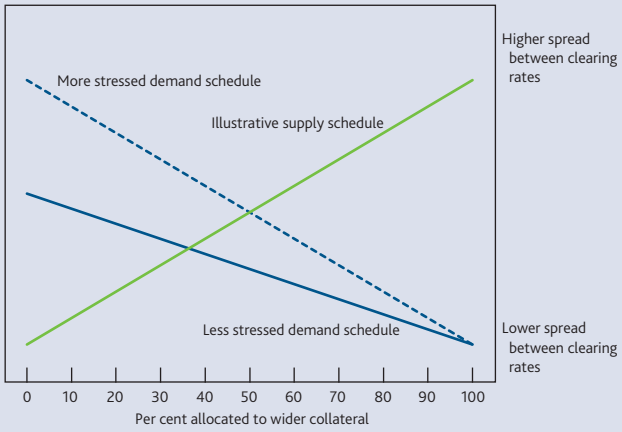
The new operations allow participants to borrow against two distinct 'sets' of collateral — one set that corresponds with securities eligible in the Bank's short-term repo operations ('narrow collateral') and a second set containing a broader class of high-quality third-party debt securities that, in the Bank's judgement, usually trade in liquid markets ('wider collateral').(3) The Bank has opted for an auction design in which the total amount of lending on offer in each auction will be fixed in advance, but the split of lending against each collateral set will be determined as part of the auction.

Counterparties will be able to bid for funds against either or both collateral sets. One could think of bids against each collateral set as separate, with bids against each type of collateral ranked from the highest interest rate bid downwards. Starting with the highest bid, each can be accepted in turn until a 'clearing rate' is reached at which either all the bids are allotted or the funds allocated to lending against that collateral set are exhausted. Hence there will be a clearing rate for each collateral set.

Assuming reasonable participation in the auctions, there would be many different ways in which the funds available in the auction could be split between the two collateral sets. And each of these possible allocations would imply a pair of clearing rates. So the available allocation choices — effectively an allocation frontier or 'demand schedule' — can be defined in terms of the spread between pairs of clearing rates. This schedule will be downward sloping, as shown in **Chart A**, because increasing the share of the auction allocated to wider collateral will either reduce the clearing rate on wider collateral or increase the clearing rate on narrow collateral. Moreover, if market conditions deteriorate, the value attached to borrowing against wider collateral, relative to borrowing against narrow collateral, may rise which would increase the slope of the demand schedule, as shown in **Chart A**.

The actual allocation will depend on the Bank's preferences for allocating funds between collateral sets, as defined by the spread between the respective clearing rates. The Bank will operate on the basis that it requires a larger spread between clearing rates to increase the proportion of the auction allocated to the wider collateral set, so the Bank's 'supply schedule' is upward sloping. The Bank does not intend to publish the details of its supply schedule, which need not be linear but is shown as such for simplicity in **Chart A**.

Chart A Percentage allocated to wider collateral set in stressed and non-stressed conditions



The intersection of the Bank's supply schedule with the revealed demand schedule from the auction will identify the collateral split and the clearing rates. Hence higher bids against wider collateral relative to narrow collateral would tend to result in a higher percentage of the auction being allocated to wider collateral.

This example shows how the new auctions will automatically react to changes in the pattern of demand for funding against the two collateral sets (and by extension, changes in market conditions). This removes the need for the Bank to make a decision before each auction on the appropriate split of funding to provide. The Bank will also be able to use the bids in successive auctions to consider changes in funding market conditions, and hence to inform the appropriate size of subsequent auctions. This was not possible in the previous extended-collateral long-term repo operations, in which the Bank imposed a restriction on bids against wider collateral being at least 50 basis points above the minimum bid rate for narrow collateral.

Operational features

A new feature of the revised auctions is that bids will be indexed to Bank Rate; ie the rate paid by counterparties will be explicitly linked to the actual level of Bank Rate over the life of the repo. Hence bids will be submitted as a spread over Bank Rate. This will allow counterparties to participate without having to take a view on the future path of Bank Rate. And unlike previous long-term repo operations, the new indexed auctions will be on a so-called uniform-price format. This means that every successful bidder on a given collateral set pays the same price, which is the lowest accepted rate (the clearing rate) for that collateral set. This should mean that participants face little incentive to alter their bids based on assumptions about other participants' likely behaviour.

Another new feature in the auctions will be the option for participants to submit 'paired bids', consisting of a single nominal amount and two spreads at which the counterparty is willing to borrow against the delivery of narrow and wider collateral respectively. This gives participants two opportunities to raise a specific quantity of funds while avoiding the risk of being allocated more than they need (which could happen if two separate bids for the same nominal amount were successful). If both sides of a paired bid are successful, the participant will be allotted against the bid which offers them better value (ie the bid with the highest spread relative to the clearing spread for that collateral type).

The new long-term repos will be offered initially once per month, with two operations with a three-month maturity and one with a six-month maturity in each calendar quarter. The overall stock of funds available will be reviewed regularly in light of prevailing financial market conditions and the level of demand at previous auctions.

(1) See *The Development of the Bank of England's Market Operations* at www.bankofengland.co.uk/markets/money/publications/condococt08.pdf.
(2) The Bank would like to thank Professor Paul Klemperer of Nuffield College, Oxford University for his contributions and advice on design issues for the new auctions.
(3) To ensure consistency across the Bank's sterling operations, the wider collateral set will initially be aligned closely with Collateral Level B for the Discount Window Facility.