Quarterly Bulletin

2010 Q1 | Volume 50 No. 1

BANK OF ENGLAND

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Foreword

Output in the United Kingdom stabilised in the second half of 2009, following a very substantial fall from its pre-crisis peak. One of the defining features of the current recession has been the role played by financial markets. Three of the articles in this *Bulletin* examine the behaviour of financial markets and how the Bank of England interacts with them.

The regular *Markets and operations* article updates on recent developments in both financial markets and the Bank's official operations. The report describes how the rally in risky asset prices that began in March 2009 was sustained into the first few weeks of 2010 but faltered in mid-January. This was accompanied by a further rise in medium-term government bond yields, especially in some European countries. One explanation for these developments is that investors demanded additional risk compensation to hold financial assets, including government bonds. According to contacts, this partly reflected greater perceived uncertainty about the sustainability of some countries' medium-term fiscal positions. Despite this recent period of retrenchment, overall market functioning did not materially worsen.

Although they faltered earlier in the year, UK equity prices have increased by more than 50% since their low point in March 2009. Even so, they still remain below their levels in mid-2007, prior to the financial crisis. It is important for policymakers to understand developments in equity prices. They influence both household and business spending, and understanding the factors driving equity price movements can help provide an insight into the forces buffeting the economy and how they might evolve over time. The article in this *Bulletin* introduces an extended dividend discount model to interpret equity price movements since the start of the financial crisis.

Indicative evidence suggests that some, but by no means all, of the movements in equity prices since mid-2007 reflected changes in investors' expectations of future earnings. Heightened uncertainty at the peak of the financial crisis may have made investors less willing to hold risky assets such as equities. The abatement of those concerns is likely to have contributed to the subsequent rise in equity prices. The policy actions taken by central banks and governments since the start of the crisis are likely to have supported equity prices, both through pushing down on government bond yields and by reducing the likelihood of more severe downside risks to the economy materialising.

The actions undertaken by the Bank in the past few years in support of its core monetary and financial stability objectives have resulted in a considerable expansion of its balance sheet. The article in this *Bulletin* describes the main components of the Bank's balance sheet both prior to and during the crisis.

The objectives of the Bank's official operations are to implement monetary policy and to reduce the cost of disruptions to the liquidity and payment services supplied by commercial banks. The expansion of the Bank's balance sheet was accompanied by a number of changes to its operational framework, some of which have been made permanent. The changes to the Bank's operations, including the introduction of new facilities, have altered the risk characteristics of the balance sheet, and the article describes how the Bank has adapted to this.

As discussed in previous *Bulletins*, a marked feature of the response of our economy to the current recession is that employment to date has not fallen by as much as we might have feared given the falls in output. The article in this *Bulletin* examines how the behaviour of the labour market in this recession compares with that in previous downturns. To date, businesses have responded to the fall in output by reducing total labour costs by a similar proportion to that in the early 1990s. But the way they have done so looks rather different, with many employees appearing better able to protect their jobs by accepting lower wage growth.

The article examines a number of factors that may help to explain why the response of the labour market has been different to the past. Structural changes in the UK economy — such as a more stable economic policy environment and the difficulty of finding employees with the appropriate skills as the economy recovers — may have mitigated the fall in employment to date relative to the early 1990s. But there are also factors specific to the current recession — including changes in labour supply, greater forbearance on the part of creditors, and sterling's depreciation — that are likely to have led to the relative resilience in employment. The labour market is continuing to adjust, however, and it is possible that the picture will change over time. At this stage, there remains considerable uncertainty about how the labour market will evolve.

The performance of the labour market was one of the topics discussed at the third Monetary Policy Roundtable, hosted by the Bank of England and the Centre for Economic Policy Research on 15 December. The Roundtables provide a forum for economists to discuss key issues affecting the design and operation of monetary policy in the United Kingdom. A report in this *Bulletin* summarises the main points made by participants at the December Roundtable.

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Research work published by the Bank is intended to contribute to debate, and does not necessarily reflect the views of the Bank or of MPC members.

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Except where otherwise stated, the source of the data used in charts and tables is the Bank of England or the Office for National Statistics (ONS). All data, apart from financial markets data, are seasonally adjusted.

Recent economic and financial developments

Markets and operations

This article reviews developments in global financial markets since the 2009 Q4 *Quarterly Bulletin* up to 19 February 2010. The article also reviews the Bank's official operations.

Global financial markets

Overview

The year end passed with few liquidity concerns and the rally in risky asset prices that began in March 2009 was sustained into the first few weeks of 2010. With advanced economies only slowly emerging from recession, monetary policy generally remained exceptionally accommodative although a few central banks tightened policy slightly and the scale of central banks' emergency liquidity support measures continued to moderate.

From mid-January, equity prices fell, corporate credit spreads widened and capital issuance slowed. This was accompanied by a further rise in medium-term government bond yields, especially in those countries with large projected fiscal deficits. It appeared that investors demanded additional risk compensation to hold financial assets, including on government bonds. Although after the data cut-off for this article there were renewed increases in equity prices, perhaps suggesting that equity market risk premia subsequently fell.

Market contacts emphasised three main sources for the increase in risk premia in late January and early February. First, investors became more concerned about the possible impact of a withdrawal of the extraordinary global monetary and fiscal policy stimuli. Second, the size of actual and prospective government borrowing intensified concerns about medium-term fiscal sustainability in a number of countries. This was most acute for Greece and some other economies in the euro area, which contributed to a marked depreciation in the euro. Third, there was increased uncertainty about the potential effects of proposals to change the structure of prudential regulation for financial firms.

Despite the recent period of retrenchment in financial markets, overall market functioning did not materially worsen. There were some signs of renewed activity in securitisation markets, although banks continued to face funding challenges, as did many non-banks.

Recent developments in international capital markets

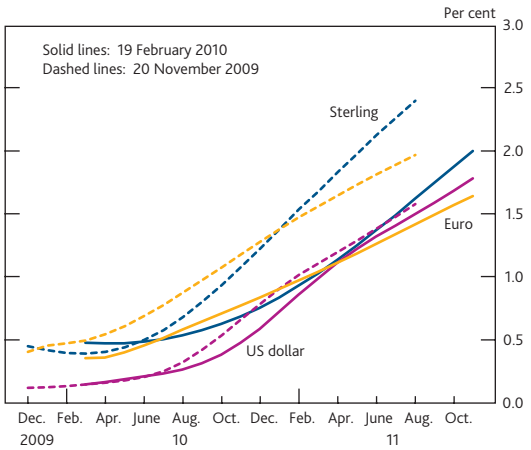
Monetary policy

While monetary policies generally remained exceptionally accommodative, some divergence began to emerge across countries reflecting the different near-term outlook for their economies. In the United Kingdom, the Monetary Policy Committee (MPC) kept Bank Rate at 0.5% and maintained the size of its asset purchase programme financed by central bank reserves at £200 billion — a level that was reached in late January. More details of the Bank's asset purchases are provided on pages 16–18 of this article.

Similarly, the US FOMC and the ECB Governing Council left key policy rates unchanged. But elsewhere, some central banks increased policy rates (for example, in Australia, Israel and Norway). And the People's Bank of China and the Reserve Bank of India increased their reserve requirement ratios in order to slow lending growth.

Looking ahead, forward interest rates derived from sterling, euro and US dollar overnight index swaps (OIS) fell. This reflected market participants expecting policy rates in the United Kingdom, euro area and United States to increase later than at the time of the previous *Bulletin* (**Chart 1**).

Chart 1 Instantaneous forward interest rates derived from OIS contracts[(a)]



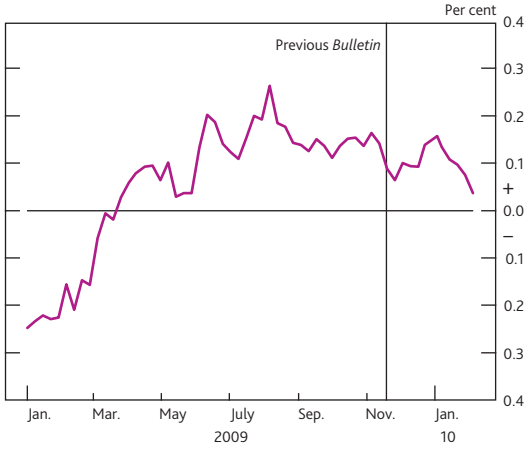
Sources: Bloomberg and Bank calculations.

(a) Instantaneous forward rates derived from the Bank's overnight index swap (OIS) curves.

The downward revision to expected policy rates might have reflected a reassessment of market participants' outlook for the pace of global economic recovery. Indeed, according to a Bank of America/Merrill Lynch survey, global fund managers' growth expectations fell slightly in February. In contrast, however, the Consensus Economics survey of economists' expectations showed a gradual improvement in expected real GDP growth for 2010.

An explanation for part of the fall in market interest rates may be that uncertainty about future policy rates declined. This could have lowered term premia embedded in OIS rates. Indeed, a model-based decomposition of the sterling OIS yield curve implied that term premia fell (**Chart 2**).

Chart 2 Model-derived sterling twelve-month forward interest rate term premia[a]



Sources: Euronext.liffe and Bank calculations.

(a) Derived from OIS rates. For more details on how term premia can be estimated, see Joyce, M, Lildholdt, P and Sorensen, S (2009), 'Extracting inflation expectations and inflation risk premia from the term structure: a joint model of the UK nominal and real yield curves', *Bank of England Working Paper no. 360*.

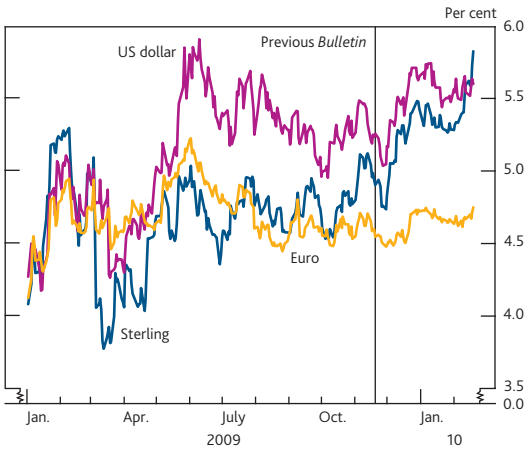
Government bond markets

At longer horizons, sterling, US dollar and to a lesser extent euro interest rates rose (**Chart 3**). With short-term interest rates falling, these developments led to a steepening in international yield curves (**Chart 4**).

A key influence on government bond markets over the quarter was investor nervousness about fiscal deficits in a number of countries. Specifically, against the background of a relatively slow economic recovery from recession, contacts frequently highlighted concerns about the sustainability of some countries' medium-term fiscal positions. As a result, investors demanded higher yields to absorb the sizable prospective government bond issuance with particularly large increases in yields on bonds issued by some euro-area economies relative to German government bond yields (**Chart 5**).

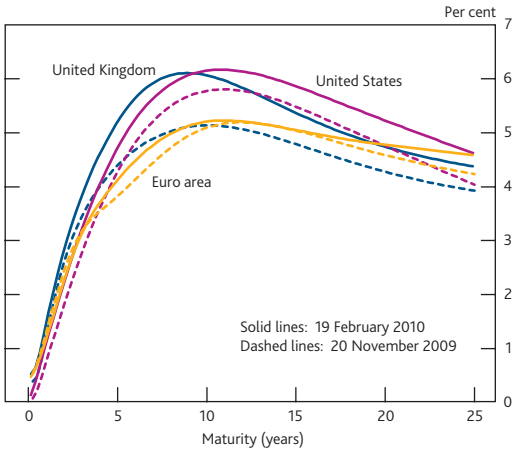
Consistent with this, the cost of protection against default on bonds issued by some European economies — in particular

Chart 3 International five-year nominal interest rates, five years forward[a]



(a) Derived from the Bank's government liability curve.

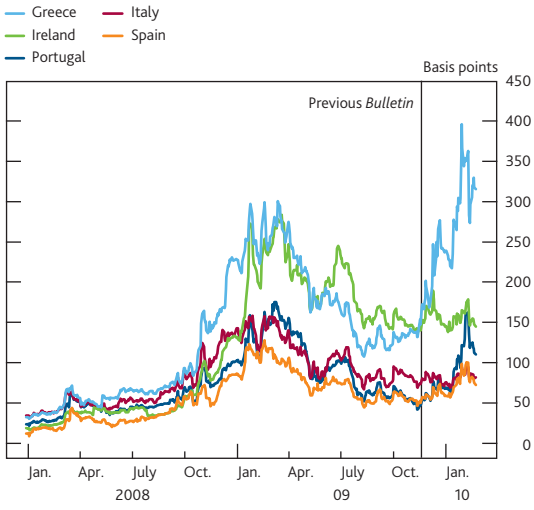
Chart 4 International nominal government bond yield curves[a]



Source: Bank calculations.

(a) Instantaneous forward interest rates.

Chart 5 Selected European ten-year government bond spreads[a]



Sources: Bloomberg and Bank calculations.

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

The sovereign credit default swap market

Sovereign credit default swaps (CDS) allow investors to insure against events of default on government debt. The market for CDS that reference advanced economy governments has grown over the past year and come under greater focus from market commentators and policymakers. This box provides an overview of the sovereign CDS market and reviews factors that influence traded market prices.

Sovereign CDS contracts

Sovereign CDS are similar to other CDS contracts — for example, those referencing corporate issuers — and can be viewed akin to an insurance contract.(1)

Specifically, one counterparty (the 'protection seller') agrees to compensate another counterparty (the 'protection buyer') if the reference entity experiences a so-called credit event. For the life of the CDS contract (sovereign CDS commonly have maturities of five or ten years), the protection buyer pays the seller a premium every three months. If, however, a credit event occurs then either party can terminate the contract, prompting a payment from the seller to the buyer. This payment compensates the CDS buyer for impairments to the value of the relevant government debt.(2) Buyers and sellers can choose to settle what they owe either using relevant sovereign debt obligations or via equivalent cash payments.

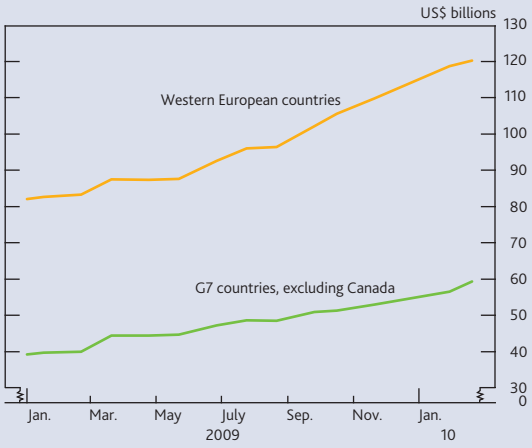
For sovereign CDS referencing advanced economies, a credit event is broadly defined as the default on, or restructuring of, a government's debt obligations. There are three principle credit events: (i) failure to pay coupons or principal; (ii) debt restructuring; and (iii) a government official disclaiming the validity of debt obligations or imposing a moratorium or standstill, which precedes a failure to pay or restructuring.

The market for sovereign CDS

Exposures to sovereign CDS are very small relative to the size of government bond markets. That remains the case despite a notable growth in turnover in sovereign CDS over the past year (**Chart A**), a period in which there has been increasing attention on public finances in a number of countries.

Sovereign CDS are traded by a wide variety of market participants, including banks, asset management firms and hedge funds. Their motives vary. For example, hedge funds, banks and asset managers often operate on both sides of the market, selling or buying protection when they believe prices are attractively high or low. Market contacts report that UK asset managers have been notable sellers of UK sovereign CDS protection over recent months. It is also common to trade the relative prices of sovereign CDS on different countries; for example, selling protection on one country and simultaneously buying protection on another country to benefit from changes in the relative creditworthiness of sovereign issuers.

Chart A Net notional dealer exposures to sovereign CDS contracts(a)



Sources: DTCC and Bank calculations.

(a) The Western Europe series includes the fifteen members of the Markit iTraxx SovX Western Europe Index, excluding Portugal and Norway.

Buyers of sovereign CDS protection are commonly seeking to hedge risk exposures, although often not simply trying to hedge the risk that government bonds in their portfolios default. For example, large banks use sovereign CDS to hedge derivative exposures to sovereign and quasi-sovereign entities (such as central banks or supranational bodies) which do not offer collateral against changes in the value of derivative trades. In addition, some asset managers use sovereign CDS as an approximate hedge against changes in a country's macroeconomic outlook. For example, a fund manager may seek to hedge risks on a large portfolio with exposure to bonds, equities and currencies using sovereign CDS. This hedge does not require an event of default to prove useful — if CDS prices change the position can be closed at a profit or loss by trading an offsetting CDS contract.

Factors that determine prices of sovereign CDS contracts

Similar to corporate CDS, sovereign CDS prices should in principle reflect investors' perceptions of the probability of a credit event by the referenced sovereign and the expected recovery rate if this occurs. Indeed, if the possibility of default was zero a CDS contract's price should be zero. An implied probability of default can be calculated directly from CDS prices by assuming what investors' recovery rate would be in the event of default and that investors are risk-neutral. For example, based on this simplistic approach, a five-year CDS spread of 100 basis points and a recovery rate of 40%, would give an implied (risk-neutral) probability of default that is roughly 9% over the five years.

Other factors are likely, however, to have a bearing on the price of sovereign insurance. To the extent that these factors affect the market price, they may cause default probabilities calculated in the simplistic way outlined above to be overestimated.

First and foremost, buyers of protection are likely to be risk-averse rather than risk-neutral. If so, uncertainty about the probability of default and/or the likely recovery rate in an event of default would typically increase the price of sovereign CDS (and other types of CDS). That is because risk-averse CDS buyers would pay extra to protect against this uncertainty.(3)

A factor particularly relevant to sovereign CDS is the likely depreciation of the sovereign's domestic currency that would accompany a credit event. This possibility would also tend to inflate prices because sovereign CDS are usually denominated in a different currency.(4) So the expected domestic currency pay-off is larger if the exchange rate is expected to depreciate by more.

There are also some technical issues that may influence traded CDS prices:

- The number of securities that can be used to settle CDS may be positively related to the insurance premium because the protection buyer can choose which debt obligations are used. This option has value as the cheapest bond can be used; thus increasing the expected pay-off. The option is difficult to price, but it may be higher for sovereign CDS than other CDS if there are more eligible securities.
- If the creditworthiness of the protection seller and the underlying sovereign are highly correlated, there may be a low chance of the seller meeting its obligations in the event of a sovereign default. This would reduce the value of the insurance. For this reason, however, investors avoid buying sovereign protection from banks that are domiciled in the reference country.
- CDS prices may also be affected by the number of active participants and liquidity in the relevant market. This could bias traded prices either up or down.

Market contacts suggest that some of these factors are difficult to price and that, in practice, many traders do not explicitly take account of all of them when trading sovereign CDS.

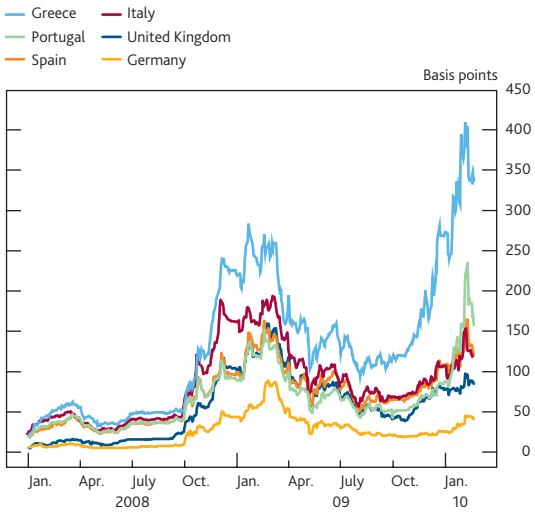
(1) For more details on CDS see Bank of England *Financial Stability Review*, June 2001, pages 117–40.
(2) In broad terms, it is determined by the difference between the cost of purchasing a debt obligation of the referenced issuer and the debt's so-called par value — what the issuer was due to pay the bondholder at the maturity of the bond. This is determined via an auction process, which provides a price, or 'recovery rate' that applies to all CDS contracts. The process is overseen by the International Swaps and Derivatives Association.
(3) A more detailed exposition of the impact of uncertainty about default probabilities and recovery rates can be found in Pan, J and Singleton, K (2008), 'Default and recovery implicit in the term structure of sovereign CDS spreads', *The Journal of Finance*, Vol. 63, No. 5, October.
(4) Sovereign CDS are often denominated in US dollars, although CDS referencing US government debt tends to be denominated in euro.

Greece — rose sharply (**Chart 6**). However, as explained in the box on pages 8–9 premia on sovereign credit default swaps (CDS) may reflect factors other than changes in the perceived probability of default.

Larger public sector deficits might, other things equal, in theory be expected to push up on real interest rates or future expected inflation (and/or compensation for uncertainty around those components of nominal returns). Over recent months, medium-term forward real interest rates rose internationally, particularly for sterling (**Chart 7**). In contrast, UK and US forward inflation rates (implied from the difference between nominal and index-linked yields) were little changed.

A model-based decomposition suggests that most of the recent rise in sterling long-term forward interest rates might reflect increased real term premia — that part of the overall

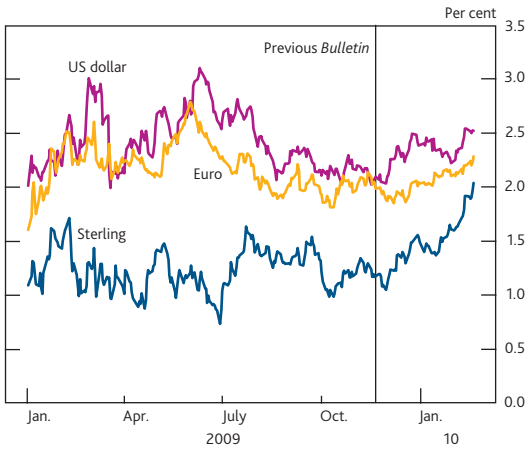
Chart 6 Selected European five-year sovereign CDS premia



Source: Markit Group Limited.

return required by investors to compensate them for uncertainty about future real rates (**Chart 8**).[1]

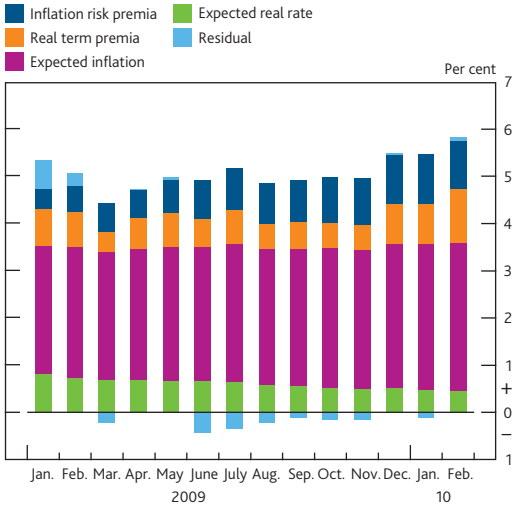
Chart 7 International five-year real interest rates, five years forward[a]



Source: Bank calculations.

(a) US dollar and sterling rates derived from the Bank's government liability curves. Euro rates derived using the Bank's inflation swap and government liability curves.

Chart 8 Decomposition of sterling five-year interest rates, five years forward[a]



Source: Bank calculations.

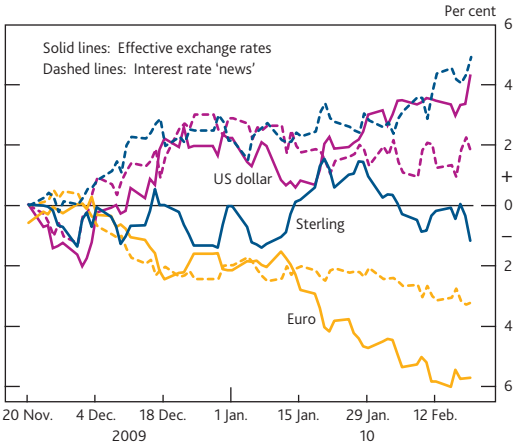
(a) For more information on the methodology used to decompose interest rates, see Joyce, M, Lildholdt, P and Sorensen, S (2009), 'Extracting inflation expectations and inflation risk premia from the term structure: a joint model of the UK nominal and real yield curves', *Bank of England Working Paper no. 360*.

Foreign exchange

Over the quarter, the largest change among the major exchange rates was a 6% depreciation of the euro. Since mid-January, relative interest rate movements could not account for the variations in the major effective exchange rates, suggesting that other factors were influential (**Chart 9**). In particular, sterling and the euro depreciated by more than suggested by changes in interest rate differentials.

Concerns about the sustainability of some euro-area economies' medium-term fiscal positions may have led

Chart 9 Implied contribution of interest rate 'news' to cumulative changes in selected ERIs since the previous *Bulletin*[a]

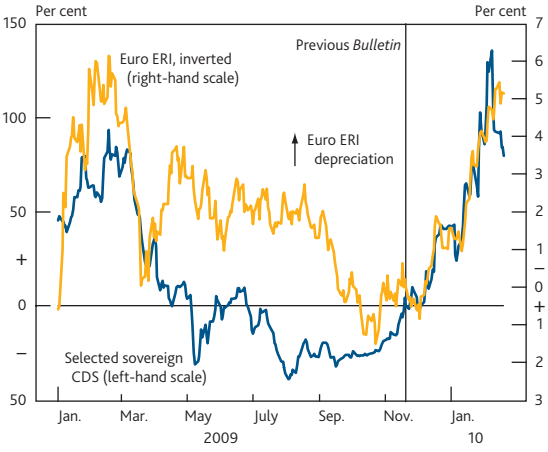


Source: Bank calculations.

(a) For more information on the analytics required to isolate the impact of interest rate 'news' on exchange rates, see Brigden, A, Martin, B and Salmon, C (1997), 'Decomposing exchange rate movements according to the uncovered interest rate parity condition', *Bank of England Quarterly Bulletin*, November, pages 377–89.

investors to demand higher risk premia on assets denominated in euro. Consistent with this, the increase in CDS prices for securities issued by these governments seemed to broadly coincide with the depreciation in the euro (**Chart 10**).

Chart 10 Cumulative changes in selected European countries' CDS premia[a] and euro effective exchange rate index (ERI) since the previous *Bulletin*



Sources: Bloomberg and Bank calculations.

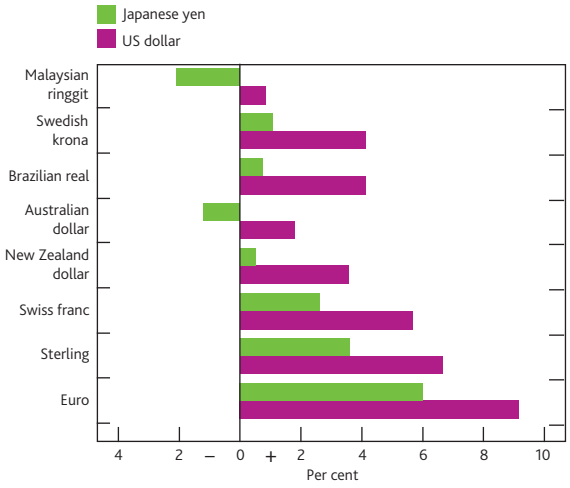
(a) The sovereign CDS premium is calculated as the average of the sovereign CDS premia of Greece, Portugal, Spain and Italy.

Over the period, the US dollar and to a lesser extent the Japanese yen appreciated. Market contacts suggested that these moves could have been amplified by some unwinding of US dollar and yen-funded investments in other currencies. This could be consistent with the appreciation of the US dollar

(1) For more details of this model, see Joyce, Lildholdt and Sorensen (2009), 'Extracting inflation expectations and inflation risk premia from the term structure: a joint model of the UK nominal and real yield curves', *Bank of England Working Paper no. 360*.

and the Japanese yen against a broad spectrum of both advanced and emerging market currencies since the previous *Bulletin* (**Chart 11**).

Chart 11 Percentage changes in selected US dollar and Japanese yen bilateral exchange rates since the previous *Bulletin*



Sources: Bloomberg and Bank calculations.

Equities

The rally in equity prices that began in March 2009 was initially sustained into the first weeks of 2010. But the major indices fell from mid-January 2010 when equity markets were caught up in a general period of risk retrenchment, primarily related to increased uncertainty about the sustainability of government debt in a number of countries (**Chart 12**). Similar moves occurred in other risky asset markets; for example, many commodity prices also fell and speculative positions in commodity markets were reduced. This suggested that a generalised increase in the risk premia demanded by investors in risky assets may have accounted for the falls in equity prices.

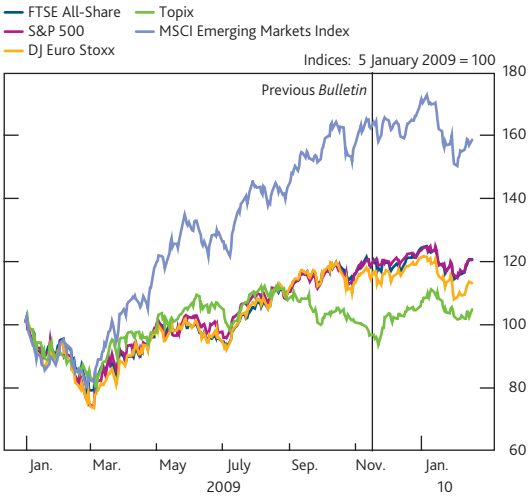
The observed rise in government bond yields might, other things equal, have also exerted some downward pressure on equity prices via a rise in the rate at which expected future cash flows are discounted. The relationship between moves in government bond yields and equity prices is discussed in a separate article on pages 24–33 of this *Bulletin*.

On the other hand, an increase in expected dividend growth could have supported equity prices and helped them end the period broadly unchanged. Indeed, dividend swap prices did strengthen slightly since the previous *Bulletin* (**Chart 13**).

Corporate credit markets

Consistent with developments in equity markets, investor appetite for corporate credit instruments continued to strengthen through December 2009 and early January 2010 before weakening as concerns about sovereign borrowers increased. Nonetheless, secondary market spreads on

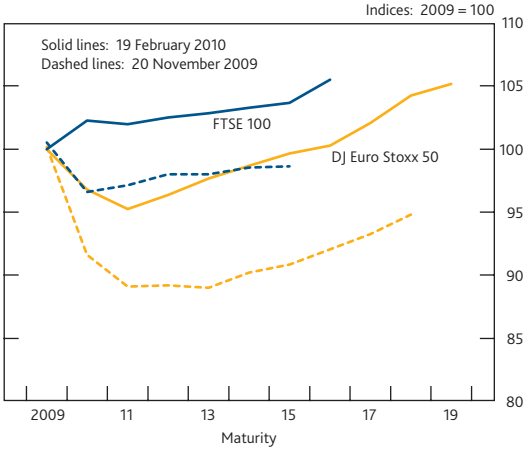
Chart 12 International equity indices[a][b]



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.

Chart 13 Dividend swap prices[a]



Sources: Bloomberg and Bank calculations.

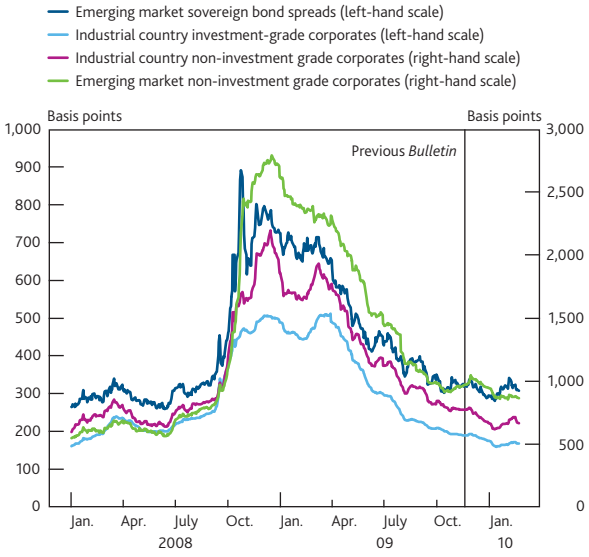
(a) From exchange-traded futures contracts. For more information on dividend swaps, see box on page 30 of this *Bulletin*.

corporate bonds ended the period narrower (**Chart 14**). And although the cost of insuring against company defaults generally picked up in February, corporate CDS prices remained close to levels in late November 2009, and increased by less than sovereign CDS prices (**Chart 15**).

In primary markets, corporate bond issuance was lower than previous quarters and from mid-January the premia charged on new issues relative to secondary market spreads widened slightly. Contacts said this might partly reflect the extent to which firms intentionally raised more funds than they required in 2009. Over the quarter, a larger share of global bond issuance was by lower-rated companies (**Chart 16**).

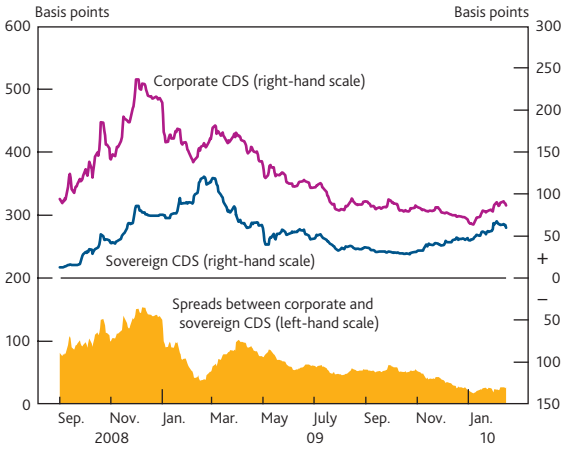
Contacts also noted that companies continued switching out of shorter-dated credit instruments, such as commercial paper,

Chart 14 International bond spreads



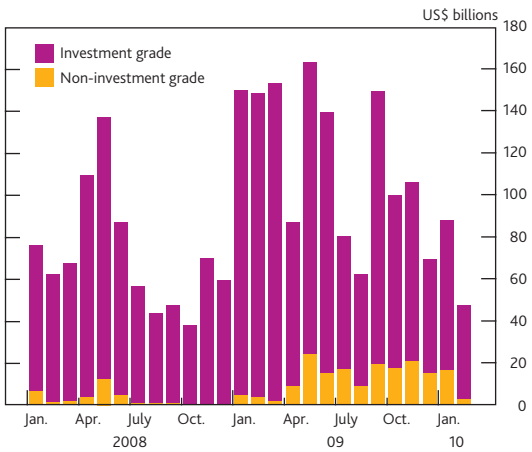
Sources: JPMorgan and Merrill Lynch.

Chart 15 Sovereign and corporate CDS spreads(a)



(a) The corporate CDS line is calculated as the weighted average of five-year corporate CDS for French, German, Dutch and UK iTraxx IG index constituents. The sovereign CDS line is the average of French, German, Dutch and UK five-year sovereign CDS, weighted using the iTraxx IG corporate index.

Chart 16 Global non-financial corporate bond issuance(a)

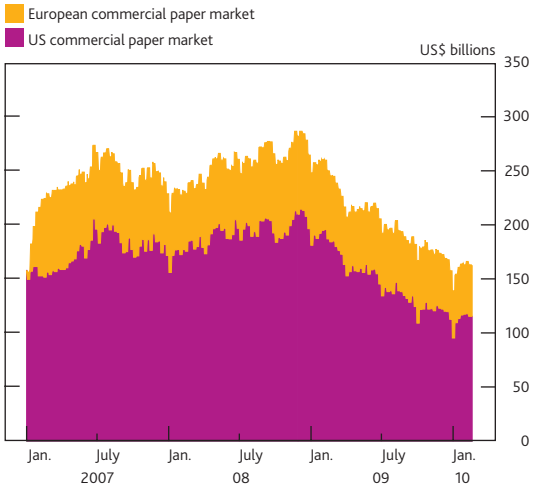


Sources: Dealogic and Bank calculations.

(a) Data for February 2010 include issuance until 19 February.

in favour of longer-term capital market funding (**Chart 17**). And demand to issue sterling commercial paper to the Bank's purchase facility also fell further, as described on page 17.

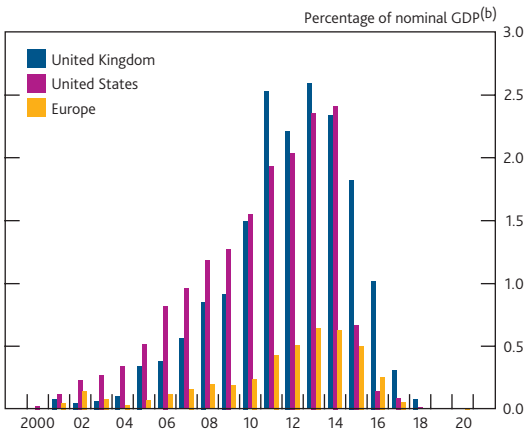
Chart 17 Private non-financial European and US commercial paper outstanding



Sources: Dealogic, US Federal Reserve and Bank calculations.

Activity in commercial loan markets remained subdued, despite the projected scale of loan refinancings falling due over the coming years — particularly for sub-investment grade firms (**Chart 18**).

Chart 18 Maturity profile of sub-investment grade term loans(a)



Sources: Dealogic, IMF and Bank calculations.

(a) Based on data for dollar, euro, and sterling sub-investment grade term loans issued by US, UK and European corporates between January 2000 and February 2010. Europe refers to corporates from Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Poland, Portugal, Spain and Switzerland.
(b) GDP data from 2009–14 is based on the IMF's October 2009 *World Economic Outlook*. For the period between 2015 and 2020, the average growth rate over the previous ten years is used.

Anecdotal evidence from the Bank's recently published *Trends in Lending* and reports from the Bank's Agents suggested a modest improvement in credit conditions facing borrowers, although the availability of credit improved more for larger companies than for smaller firms and, overall, credit conditions

Non-banks and the corporate loan market

Companies can access finance through a number of sources. For example, they can issue equity, or raise debt finance from both the bank and non-bank sectors. But contacts report there have been relatively few non-bank entrants to the UK loan market over the past couple of years. And that is despite relatively wide prospective lending margins and a potential advantage over competitors who are facing increasing impairments on their existing loans.

The Bank has discussed the impediments to entering the loan market faced by non-bank lenders with its market contacts. This box outlines the information the Bank received.

In summary, contacts suggested a range of interwoven impediments do exist in the United Kingdom, as described below. HM Treasury — working closely with the Bank — launched a Discussion Paper on non-bank lending in January 2010.(1)

Impediments to entry in the UK corporate loan markets

Companies can raise debt finance either through loan agreements or by issuing debt. Most UK lending is provided by the banking sector. But it could also be supplied by other non-bank institutions, such as pension funds, insurance companies and fund managers. For example, in the United States there is a well-developed market for non-banks to lend to firms via private placements. In addition, non-bank loan funds existed in the United States prior to the increased involvement of collateralised loan obligations (CLOs) funds, notable participants from the late 1990s. UK and European markets had little non-bank involvement before CLOs developed. So with the role of CLOs now diminished somewhat, European markets are left with less well-developed non-bank involvement.

In describing the United Kingdom's situation, contacts cited the following impediments to non-banks providing more loans:

- **Loan structure**: Loans have a number of features that make them less appealing to non-bank investors, particularly those who seek to match longer-maturity liabilities. For example, loans are private rather than public instruments and are often non-tradable or have restrictions on the ability to on-sell. In addition, a large proportion of loans are credit facilities which, because of their liquidity provision nature are better suited to banks than non-banks. And loans can also frequently be paid down early, including via refinancing, which makes their maturity shorter, and their profile less certain than capital market alternatives.
- **Loan pricing**: Many banks provide a suite of products to businesses, enabling them to cross-subsidise individual products. A range of contacts said that corporate lending rates were often subsidised by 'ancillary business lines' and that this made it difficult for non-bank entrants, without the full suite of products, to compete on the loan component alone.
- **Infrastructure**: Some contacts noted that the stability in the bank-orientated nature of loan provision in the United Kingdom for a number of years may have lessened the impetus to invest in a more efficient loan market infrastructure. Contacts noted the absence of benchmark loan indices and third-party credit ratings, both of which exist in some form in the United States. They thought that the presence of both would make it easier for non-bank institutions that invest via third-party mandates to enter the corporate loan market. Additional impediments mentioned included an outdated paper-based settlement process and the treatment of loans by many non-bank institutional investors as part of an 'alternative investment' asset class. Some contacts identified UK pension fund trustees' reliance on investment consultants as impeding investments in loans as an asset class.
- **Diversification**: Many contacts reported a need to invest across European loans if the asset class was to offer sufficient diversification of risks. But this was said to be impeded by differences in legal standards across Europe, particularly bankruptcy frameworks and the uncertainties across jurisdictions around the treatment of senior creditors.

Evaluating the current impact of the cited impediments, and carefully assessing the costs and benefits of change is a significant task — the impediments are interrelated and there are a wide variety of stakeholders in both the private and public sector. The Treasury Discussion Paper on non-bank lending brought together these loan-specific issues, with related questions about access to public capital markets. The Treasury will lead the ongoing work on this issue, but the Bank will remain closely involved and will continue to feed in intelligence gathered from its market contacts.

(1) www.hm-treasury.gov.uk/fin_non_banking.htm.

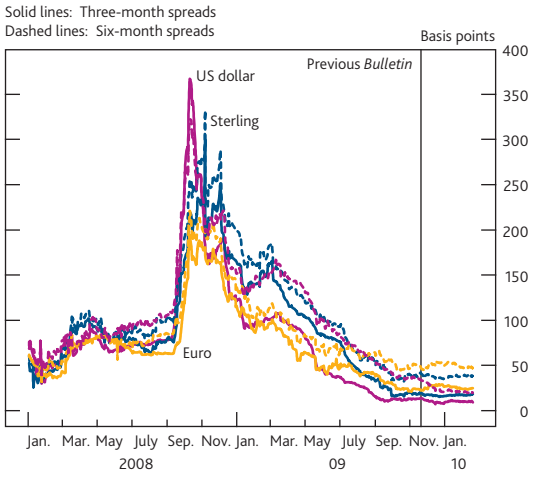
remained tight. In addition, contacts noted that both the supply of and demand for syndicated and regular loans remained anaemic. Moreover, despite elevated lending margins, there continued to be few non-bank entrants to the corporate lending market, which is discussed in the box on page 13.

Contacts in loan markets noted that the volume of restructurings and insolvencies remained lower than expected. They attributed this largely to the effects of low monetary policy rates on floating-rate coupon payments, as well as the strength of alternative sources of funding for companies. But they also highlighted some forbearance by lenders, as evidenced by a rise in the number of so-called amend and extend deals, where borrowers agree to a maturity extension in return for a fee and higher coupon payments.

Bank funding markets

Conditions in short-term money markets remained broadly unchanged. Three-month Libor-OIS spreads remained stable, at levels just a little above their long-term averages and well down on their peaks over recent years (**Chart 19**). Libor spreads at six months and beyond remained a little more elevated, however, indicating an extra premium to borrow for longer maturities.

Chart 19 Three and six-month Libor relative to expected short-term interest rates[a]



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

(a) Spread of Libor to equivalent-maturity OIS rates.

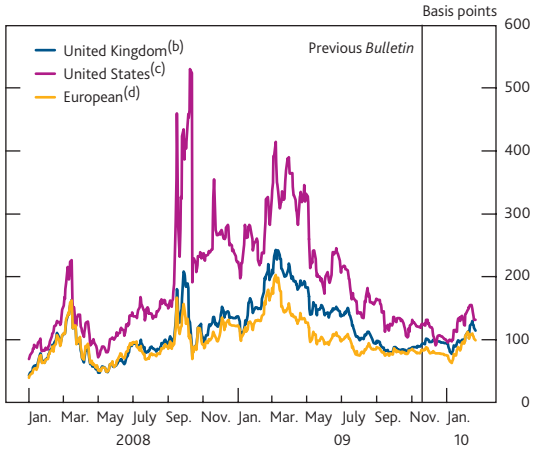
According to contacts, a number of factors continued to affect the cost of money market lending. The significant injection of central bank liquidity over the past year has led to reduced bank demand for funding at short maturities. Furthermore, UK-regulated entities now have a preference to fund at maturities greater than three months following the Financial Services Authority's new liquidity regime published in 2009 Q4. Contacts noted in particular that the resulting demand for longer-dated funds may have supported six-month Libor-OIS spreads.

Some of the emergency liquidity support measures adopted by central banks expired and others approached the end of their lifespan over the quarter. For example, central bank liquidity swap lines expired (see page 20 for more details of the Bank's swap line with the Federal Reserve) and the Term Asset-Backed Securities Loan Facility in the United States is due to close on 31 March 2010. Market contacts continued to expect a further gradual reduction of liquidity support from central banks. The US Federal Reserve's decision to increase its discount rate on 19 February strengthened these expectations.

There were, however, some renewed signs of stress in cross-currency funding markets. This seemed to be related to risk aversion associated with increased worries about sovereign default risk in Europe, and Greece in particular. In early February the cost of swapping funds raised in euro and sterling to US dollars via cross-currency swaps rose, although in the context of changes over the past year the increase was small.

The general increase in perceived sovereign risk from mid-January was also accompanied by higher CDS premia on bank debt (**Chart 20**). This was reportedly because banking systems still rely on support (both actual and contingent) from governments. Contacts also noted concerns about the potential for banks to make losses on holdings of Greek government debt, as well as potential difficulties for banks using these securities as collateral with the ECB should there be a further downgrade to Greece's sovereign debt rating. Separately, and in contrast, contacts noted some positive news about the UK commercial property sector, as described in the box on page 15.

Chart 20 Selected international banks' CDS premia[a]



Source: Markit Group Limited.

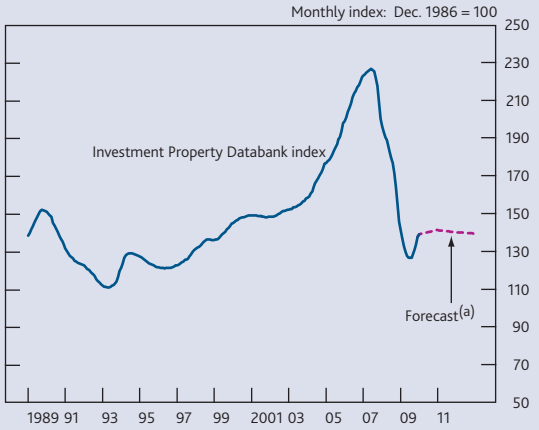
(a) Unweighted averages of five-year, senior CDS prices.
(b) Average of Barclays, HSBC, Lloyds Banking Group, RBS and Standard Chartered.
(c) Average of Bank of America, Citi, Goldman Sachs, JPMorgan and Morgan Stanley.
(d) Average of BBVA, BNP Paribas, Crédit Agricole, Credit Suisse, Deutsche Bank, Santander, Société Générale, UBS and UniCredit.

UK commercial property

The Bank has previously flagged exposure to the commercial property sector as a potential risk for UK banks.(1) This box provides an update of some recent developments.

In the United Kingdom, the Investment Property Databank all-property capital value index rose by 1% in January 2010, bringing cumulative growth since its trough in July 2009 to about 10% (**Chart A**).

Chart A UK commercial property capital values

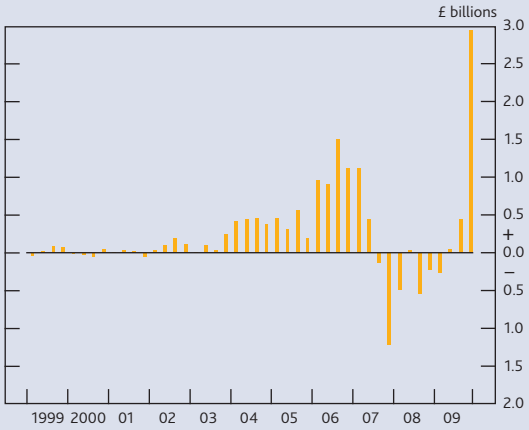


Sources: Investment Property Databank, Morgan Stanley, Thomson Datastream and Bank calculations.

(a) Dashed line is implied property price forecast on 15 February, calculated by adjusting the value of derivatives contracts for total returns for income returns, which are assumed to revert to their long-run average over the next three years.

According to contacts, this principally reflected an increase in demand for prime properties by foreign investors as well as by domestic institutional and retail investors. Indeed, at £2.9 billion, data from the Association of Real Estate Funds show that net inflows into UK commercial property funds reached a record high in 2009 Q4 (**Chart B**).

Chart B Net inflows into UK unlisted pooled property funds



Sources: Association of Real Estate Funds and Bank calculations.

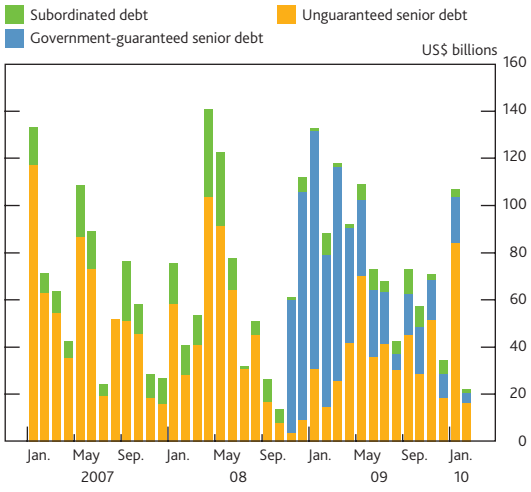
Despite the recent increases, UK commercial property values remain well below their peak in June 2007 and derivatives appear to price in little capital gain over the next few years.

(1) For a detailed description see the box on pages 24–25 of the December 2009 *Financial Stability Report*.

At longer horizons, banks face a challenge to secure funding to replace government-sponsored schemes which will expire over the next couple of years. As part of their strategy to address this funding gap, banks issued a significant amount of senior debt over recent months (**Chart 21**). This included record issuance from UK banks in January, although issuance was markedly weaker in February. And while many government-guarantee schemes continued, some banking sectors reduced their dependence on these.

Contacts also reported that banks were increasingly looking to securitisation and covered bond markets to raise funds. Covered bond issuance continued to increase; including from banks whose issuance was not eligible for ECB purchase. Prospects for issuance of mortgage-backed securities also reportedly improved. Total issuance in the first months of 2010 remained limited (**Chart 22**), despite individual issues by, for example, Lloyds Banking Group and Co-operative Bank. Other banks were reported to be preparing for future issuance, however, including the possibility of issues that do not give the investor an option to sell back the debt.

Chart 21 Global bank debt issuance(a)



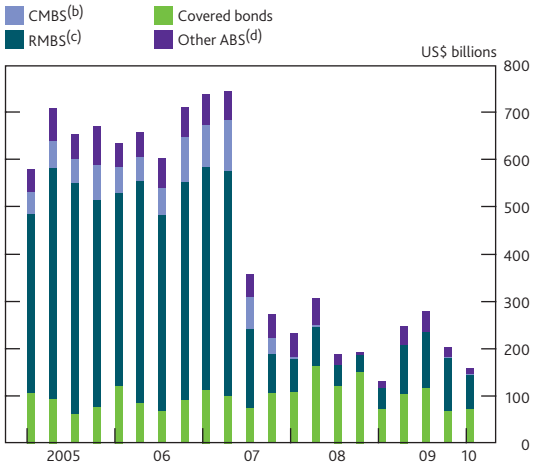
Source: Dealogic.

(a) Issuance with a value no less than US$500 million equivalent and original maturity greater than one year.

However, despite recent debt issuance, contacts highlighted that for many banks the combined pace of long-term funding was not yet sufficient to meet refinancing needs without some corresponding reduction in assets. And while capital markets

remained open for banks to issue subordinated debt, contacts noted that banks may have little incentive to issue such securities in light of the uncertainty about prospective changes to prudential regulation. Specifically, the Basel Committee on Banking Supervision released a consultative document that raised questions about whether new issuance would be counted as capital going forward.

Chart 22 Global issuance of asset-backed securities(a)



Sources: Dealogic and Bank calculations.

(a) Only includes non-retained issuance, proxied by issuance that is eligible for inclusion in underwriting league tables.
(b) Commercial mortgage-backed securities.
(c) Residential mortgage-backed securities.
(d) Asset-backed securities.

Bank of England operations

The Bank's balance sheet continued to expand, increasing from £235 billion at the end of the previous review period to £247 billion at the end of the current review period. This expansion principally reflected purchases of public sector assets under the Asset Purchase Facility (APF) following the MPC's decision on 5 November to increase the size of the programme of asset purchases financed by the issuance of central bank reserves by £25 billion to £200 billion. Over the review period, the stock of long-term repo open market operations (OMOs) fell, reflecting reduced demand for liquidity insurance.(1) The remainder of this section describes the Bank's operations over the review period in more detail.

Asset purchases(2)

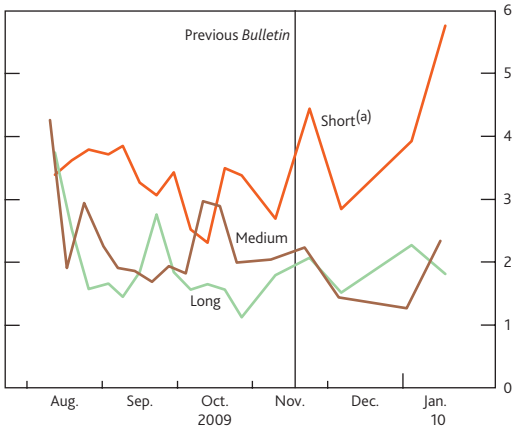
In the week prior to the February 2010 MPC meeting, the Bank met the target set by the MPC of purchasing £200 billion of private and public sector assets financed by the issuance of central bank reserves; a policy first announced on 5 March 2009 and extended on 7 May, 6 August and 5 November 2009. On 4 February 2010, the MPC voted to maintain the stock of asset purchases financed by the issuance of central bank reserves at £200 billion. The Bank announced that it would continue to purchase high-quality private sector assets financed by the issue of Treasury bills and the Debt Management Office's (DMO) cash management operations, in line with the arrangements announced on 29 January 2009. **Table A** summarises asset purchases over the review period by type of asset.(3)

Gilts

Following the MPC's decision on 5 November to increase the scale of the programme of asset purchases from £175 billion to £200 billion, 15 auctions of £1.7 billion were conducted according to a two-week cycle. Gilts with a residual maturity of 10–25 years and 3–10 years were purchased on the Monday and Wednesday of the first week and gilts with a residual maturity greater than 25 years were purchased on the Tuesday of the following week. With the exception of the final two weeks of December, where no purchases were made, this cycle was repeated in subsequent weeks until the final week in January.

Cover in the auctions varied over the review period, averaging 4.2 in the 3–10 year auctions, 1.8 in the 10–25 year auctions and 1.9 in auctions for gilts with a maturity greater than 25 years (**Chart 23**).

Chart 23 Cover ratios in APF gilt auction



(a) On 6 August 2009, the short-maturity bucket changed from 5–10 years to 3–10 years. The medium and long-maturity buckets are 10–25 years and greater than 25 years respectively.

By the end of January 2010, £198.3 billion of gilts had been purchased under the asset purchase programme, of which £88.6 billion were in the 3–10 year residual maturity range, £84.8 billion in the 10–25 year maturity range and £24.8 billion had a maturity greater than 25 years (**Chart 24**). These gilt purchases took place over 92 auctions which varied in size up to a maximum of £3.5 billion.

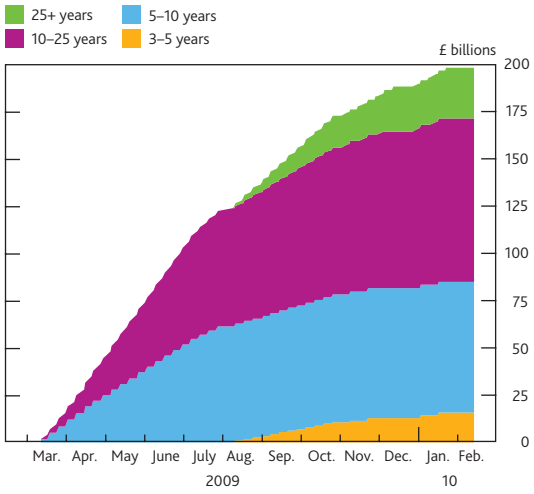
(1) See Cross, M, Fisher, P and Weeken, O (2010), 'The Bank's balance sheet during the crisis' on pages 34–42 in this *Bulletin*, for a detailed description of the Bank's operations and how the Bank's balance sheet has expanded during the crisis.
(2) The data cut-off for this subsection is 18 February.
(3) The objectives and operation of the APF are described in more detail in the 2009 Q2 *Quarterly Bulletin*.

Table A APF transactions by type (£ millions)

Week ending[a]	Commercial paper	Gilts	Corporate bonds		Total[b]
			Purchases	Sales	
19 November 2009[c][d]	588	177,875	1,522		179,985
26 November 2009	224	3,400	5	0	3,629
3 December 2009	0	1,701	4	0	1,705
10 December 2009	125	3,400	2	0	3,527
17 December 2009	190	1,700	0	0	1,890
24 December 2009	0	0	0	0	0
31 December 2009	25	0	0	0	25
7 January 2010	25	3,400	0	0	3,425
14 January 2010	30	1,700	10	76	1,664
21 January 2010	275	3,400	29	19	3,685
28 January 2010	200	1,700	0	8	1,892
4 February 2010	25	0	3	18	10
11 February 2010	0	0	12	2	10
18 February 2010	0	0	8	12	-4
Total financed by a deposit from the DMO[d][e]	–	–	12		–
Total financed by central bank reserves[d][e]	279	198,275	1,455		200,009
Total asset purchases[d][e]	279	198,275	1,467		200,009

(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) 19 November 2009 measured as amount outstanding as at 19 November 2009.
(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.

The Bank continued to lend some of its gilt holdings via the DMO in return for other UK government collateral. Between 1 October and 31 December 2009 a daily average of £3.3 billion was lent in this way. Use of the facility continued to generally be concentrated in gilts in which the Bank holds a large proportion of the free float (the total amount of a gilt in issue less those held by the UK Government).

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. As of 18 February 2010, APF holdings of CP amounted to £0.3 billion, down from £0.6 billion as of 19 November 2009. Gross purchases over the period were £1.2 billion, compared with redemptions of £1.5 billion, as the Facility primarily acted as a backstop, following temporary reductions in market liquidity. The majority of primary spreads in the market remained below the spreads at which the APF offers to purchase CP.

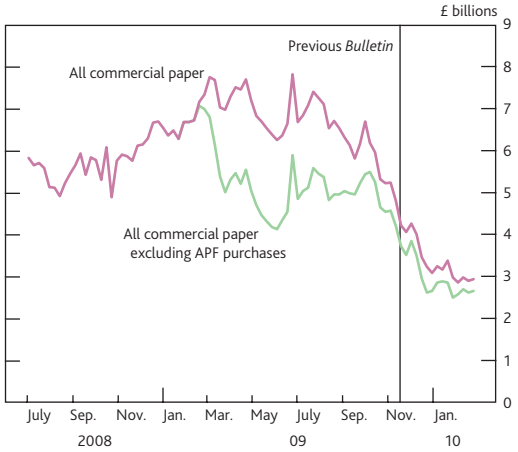
In the wider market, the total amount of sterling-denominated CP outstanding for UK corporate and non-bank financial firms fell over the review period from £4.2 billion to £2.9 billion as issuers continued to raise longer-term issuance in the corporate bond market and CP issuance in other currencies (**Chart 25**).

Corporate bonds

The Bank's Corporate Bond Secondary Market 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. To fulfil this aim the Bank has offered, since March 2009, to make small purchases of a wide range of high-quality corporate bonds by reverse auctions.

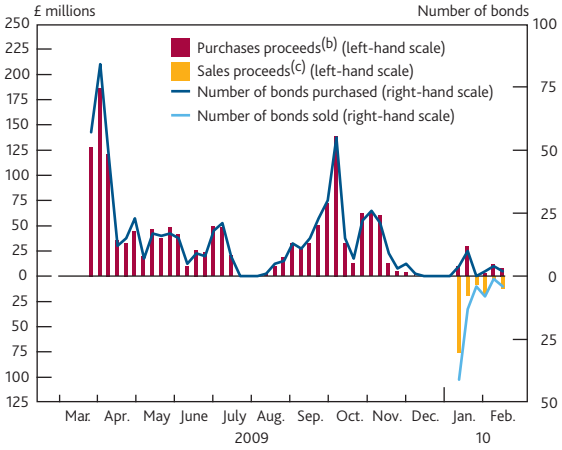
On 3 December 2009 the Bank launched a consultation on proposals for a possible extension to the Scheme through the Bank of England Asset Purchase Facility Fund (BEAPFF) operating as a seller, as well as a buyer, of corporate bonds. The proposals were aimed at improving secondary market

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



Sources: CP Ware and Bank calculations.

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.

liquidity. The proposals received positive feedback from market makers, other dealers and corporates. Accordingly, on 22 December 2009 the Bank announced that it would commence sale auctions on 8 January 2010, with the new timetable of operations consisting of two purchase auctions and one sale auction each week. The Bank may also sell bonds into tender offers initiated by the issuing firm where such sales are consistent with the overall objectives of the programme, including prudent risk management.

The first corporate bond sale auction received a high level of activity, with counterparties bidding £1.2 billion in total across every bond in the auction. This auction coincided with a period of heightened investor demand for corporate bonds, and, as the first operation of its type, market contacts noted the auction drew an elevated level of interest. Over the proceeding auctions the level of activity moderated, with an average of £157 million bid for by counterparties, and £12 million sold by the Bank, in the subsequent five operations.

Activity in corporate bond purchase operations fell towards the end of 2009, with four consecutive weeks from mid-December in which the Bank made no purchases. Seasonal factors along with increased investor demand for corporate bonds are likely causes of this fall. Activity increased modestly in the New Year, with an average of £94 million offered by counterparties.

As of 18 February 2010, the Bank portfolio totalled £1,467 million, compared to £1,522 million at the end of the previous review period on 19 November 2009. This fall reflected the effect of corporate bond sales (**Chart 26**).

Credit Guarantee Scheme

The Bank did not make any purchases of bank debt issued under the Credit Guarantee Scheme from the secondary market, but stands ready to do so should conditions in that market deteriorate.

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, and no SCP programmes have so far been deemed eligible. This largely reflects a change in market conditions since the original consultation. Existing asset-backed commercial paper (ABCP) programmes are now able to fund themselves in the US ABCP market, where pricing has largely normalised. There is also sufficient 'spare capacity' in these programmes to fund further assets if required. That means there has not been demand to set up new conduits to be funded by the SCP facility.

Operations within the sterling monetary framework

During the period under review, the level of reserves was determined by (i) the level of reserves injected via asset purchases, (ii) the reserves supplied in long-term repo OMOs, and (iii) the net impact of other sterling ('autonomous factor') flows across the Bank's balance sheet. Aggregate reserves rose over the review period from £145 billion on 20 November 2009 to £155 billion on 19 February 2010, as the fall in the stock of long-term repo OMOs was more than offset by the increase in reserves injected via asset purchases.

The continued reduction in the outstanding stock of long-term repo OMOs reflected reduced demand for liquidity insurance. Indeed, all three-month extended-collateral long-term repo OMOs over the review period were uncovered (**Table B**).

(1) The SCP facility is described in more detail in the Market Notice available at www.bankofengland.co.uk/markets/marketnotice090730.pdf.

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

1 December 2009	
On offer (£ millions)	5,000
Cover	0.30
Weighted average rate[a]	0.500
Lowest accepted rate[a]	0.500
Tail[b]	0.00
15 December 2009	
On offer (£ millions)	5,000
Cover	0.12
Weighted average rate[a]	0.878
Lowest accepted rate[a]	0.500
Tail[b]	0.38
5 January 2010	
On offer (£ millions)	5,000
Cover	0.32
Weighted average rate[a]	0.504
Lowest accepted rate[a]	0.500
Tail[b]	0.00
12 January 2010	
On offer (£ millions)	5,000
Cover	0.59
Weighted average rate[a]	0.540
Lowest accepted rate[a]	0.500
Tail[b]	0.04
16 February 2010	
On offer (£ millions)	5,000
Cover	0.85
Weighted average rate[a]	0.851
Lowest accepted rate[a]	0.500
Tail[b]	0.35

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

On 8 January 2010, the Bank announced that, with immediate effect, it would reduce the frequency of extended-collateral three-month long-term repo operations from twice monthly to monthly until a new permanent design for long-term repo operations is introduced later in 2010.(1)

The Bank continued to set two minimum bid rates for its three-month extended-collateral long-term repo OMOs. The minimum bid rate for bids against routine OMO collateral remained at the higher of the equivalent-maturity OIS rate and Bank Rate. For bids against the wider collateral pool, the minimum bid rate remained 50 basis points higher than that for routine OMO collateral.

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 the repo operations at three-month maturity all these operations were covered (**Table C**).

Table C Long-term repo operations

	Six-month	Nine-month	Twelve-month
15 December 2009			
On offer (£ millions)	750	400	200
Cover	3.07	4.50	5.50
Weighted average rate[a]	0.484	0.581	0.721
Lowest accepted rate[a]	0.477	0.581	0.721
Tail[b]	0.01	0.00	0.00
12 January 2010			
On offer (£ millions)	750	400	200
Cover	2.89	4.50	6.25
Weighted average rate[a]	0.507	0.576	0.740
Lowest accepted rate[a]	0.491	0.553	0.740
Tail[b]	0.02	0.02	0.00
16 February 2010			
On offer (£ millions)	750	400	200
Cover	3.10	3.75	2.60
Weighted average rate[a]	0.535	0.575	0.680
Lowest accepted rate[a]	0.530	0.570	0.680
Tail[b]	0.00	0.01	0.00

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

Operational Standing Facilities

As part of the changes to the sterling monetary framework (SMF) introduced on 5 March 2009, the Bank announced that, if Bank Rate was set at 0.5% or below, the rate paid on the Operational Standing Deposit Facility would be zero, while the rate charged on the Operational Standing Lending Facility would continue to be set at 25 basis points above Bank Rate.

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 usage of the lending facility was also £0 million throughout the period.

Discount Window Facility

In October 2008, the Bank introduced a Discount Window Facility (DWF) as part of the framework for its operations in the sterling money markets. The 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 5 January 2010, the Bank announced that the average daily amount outstanding in the Discount Window Facility between 1 July and 30 September 2009 was £0 million.

(1) The Bank's Consultation Document of October 2008 contains further information on the proposed new operational design for extended-collateral three-month repo operations.

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.

US dollar repo operations

In concert with other central banks, on 18 September 2008 the Bank announced measures to offer dollar financing to financial institutions funded by a swap with the Federal Reserve. These measures were designed to improve the liquidity conditions in global financial markets.

The Bank initially offered US dollar financing at overnight, one-week, one-month and three-month maturities. In light of reduced demand for these operations the Bank had previously suspended all but the one-week operation. In co-ordination with other central banks, the Bank confirmed on 27 January 2010 that its temporary liquidity swap lines with the Federal Reserve would expire on 1 February 2010. The one-week operation conducted on 27 January 2010 was, therefore, the final US dollar repo operation. Since the previous *Bulletin*, the total stock outstanding has fallen from $13 million to zero.

Foreign reserves

As part of the monetary policy framework introduced by the Chancellor of the Exchequer in 1997, the Bank of England holds its own foreign exchange reserves in support of its monetary policy objective. These reserves are separate from the Government's foreign exchange reserves, which the Bank manages as HM Treasury's agent. They are financed with medium-term foreign currency securities issued by the Bank. At the end of the review period, the Bank's foreign exchange reserves comprised £3.9 billion of assets compared to £4 billion at the start of the review period.

Capital portfolio

The Bank holds an investment portfolio that is approximately the same size as its capital and reserves (net of equity holdings, eg in the Bank for International Settlements and European Central Bank, and the Bank's physical assets) and aggregate cash ratio deposits. The portfolio consists of sterling-denominated securities. Securities purchased by the Bank for this portfolio are normally held to maturity; nevertheless sales may be made from time to time, reflecting for example, risk management, liquidity management or changes in investment policy.

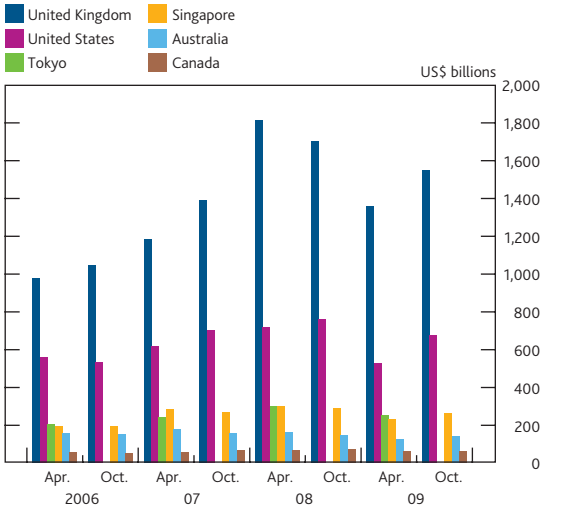
The portfolio currently includes around £3.2 billion of gilts and £0.6 billion of other debt securities. Over the period from 20 November 2009 to 19 February 2010, gilt purchases were made in accordance with the quarterly announcements on 1 October 2009 and 4 January 2010.

Developments in market structure

Global foreign exchange turnover

Results of the October 2009 Foreign Exchange Joint Standing Committee survey for the UK foreign exchange (FX) market were published on 25 January 2010, in co-ordination with five other committees publishing similar surveys for other markets. Overall, the results showed that compared with April 2009, foreign exchange turnover increased in all of the main markets. However, turnover remained below levels reported prior to the intensification of pressures in financial markets in Autumn 2008 (**Chart 27**).

Chart 27 Global foreign exchange average daily turnover[a][b]



Sources: Australian Foreign Exchange Committee, Canadian Foreign Exchange Committee, London Foreign Exchange Joint Standing Committee, New York Foreign Exchange Committee, Singapore Foreign Exchange Market Committee and Tokyo Foreign Exchange Committee.

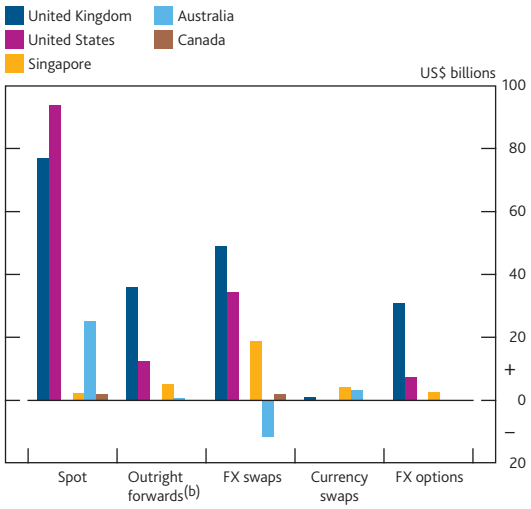
(a) Turnover figures include spot currency, outright forwards, foreign exchange swaps, currency swaps and foreign exchange options.
(b) The Tokyo Foreign Exchange Committee survey is conducted annually, whereas the others are conducted bi-annually.

The United Kingdom remained the largest centre for foreign exchange activity, accounting for 57.6% of reported global turnover. Average daily turnover increased across all products with the most significant increases in spot FX and FX swaps. Spot FX increased by $77 billion in the United Kingdom compared with $94 billion in the United States, while FX swaps increased by $49 billion in the United Kingdom and $35 billion in the United States (**Chart 28**).

London Stock Exchange bond trading platform for retail investors

In response to demand from retail investors, on 1 February 2010 the London Stock Exchange launched a new electronic order system for bonds. Similar to arrangements for individuals to deal in shares, the new service offers continuous two-way pricing for trading in increments of as little as £1 for gilts and £1,000 for corporate bonds. Normally these investments would trade in units of £50,000.

Chart 28 Changes in foreign exchange average daily turnover by instrument between April and October 2009[a]



Sources: Australian Foreign Exchange Committee, Canadian Foreign Exchange Committee, London Foreign Exchange Joint Standing Committee, New York Foreign Exchange Committee and Singapore Foreign Exchange Market Committee.

(a) Tokyo is excluded because the Tokyo Foreign Exchange Committee publish their survey annually.
(b) Outright forwards data include non-deliverable forwards for the United Kingdom.

Initially, 49 gilts and ten corporate bonds are available for trading including securities issued by a range of large companies and a bond issued specifically for this new service by Royal Bank of Scotland. The new market is supported by dedicated market makers.

Research and analysis

Interpreting equity price movements since the start of the financial crisis

By Mika Inkinen of the Bank's Foreign Exchange Division and Marco Stringa and Kyriaki Voutsinou of the Bank's Macro Financial Analysis Division.[1]

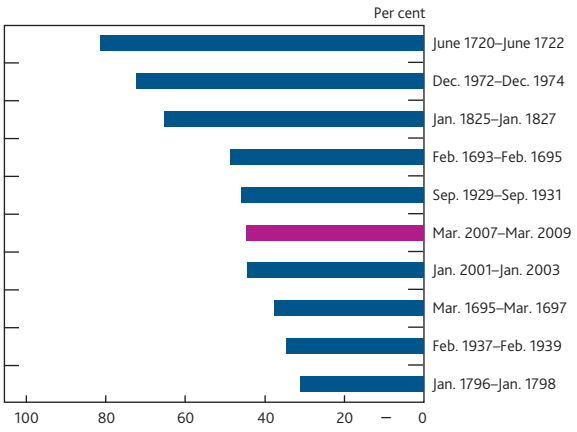
Equity markets have experienced large price movements since the financial crisis began in mid-2007. Understanding the factors that drive equity prices is important for policymakers as they may contain information about the future course of the economy. This article uses a simple model to decompose recent equity price movements into changes in earnings expectations, the risk-free rate and the equity risk premium. Indicative evidence suggests that changes in earnings expectations can account for some, but by no means all, of the shifts in equity prices since mid-2007. Policy actions by central banks and governments are likely to have supported equity prices, for example by lowering government bond yields and reducing the likelihood of more severe downside risks to the economy materialising. The latter may also have contributed to a fall in the implied level of the equity risk premium, which had increased sharply during the financial crisis.

Introduction[2]

There have been some historically large equity price movements since the financial crisis began in mid-2007. In the two years to their March 2009 trough, UK equity prices experienced one of their largest two-year falls since data were first recorded in 1693 (**Chart 1**). Since then, equity prices have risen sharply, experiencing the eighth largest eleven-month increase. This recovery in equity prices was accompanied by unprecedented policy actions, including the Bank of England's programme of asset purchases — sometimes referred to as quantitative easing.[3] Nonetheless, real equity prices remain below previous peaks in 1999 and 2007 (**Chart 2**).

Equity prices can directly affect the economy via a number of channels. For example, they can influence consumer spending through their impact on both households' financial wealth and consumer confidence. They also affect the cost of capital raised in equity markets and, hence, companies' investment decisions. And large, persistent moves in equity prices may affect the resilience of market participants' balance sheets, potentially increasing the risks to financial stability. Aside from their effects on the economy, equity prices also provide policymakers with an insight into market participants' views about the outlook for companies, as well as the wider macroeconomic environment. This can in turn help policymakers with the significant challenge of identifying the types of shocks that have hit the economy.

Chart 1 Ten largest two-year falls in UK nominal equity prices[a][b]



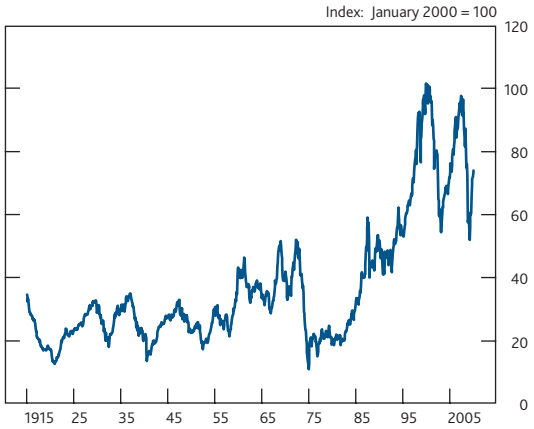
Sources: Global Financial Data Inc. and Bank calculations.

(a) Composite index comprising of East Indies stock for 1693; Bank of England and East Indies shares from 1694 to August 1711; Bank of England, East Indies and South Sea shares from September 1711 to January 1811; Rostow's Total Index of Share Prices from 1811 to 1867; London and Cambridge Economic Service Index from 1867 to 1906; The Banker's Magazine Index from 1907 to May 1933; Actuaries General Index from June 1933 to April 1962; FTSE All-Share from April 1962 onwards.
(b) Non-overlapping two-year falls.

It is therefore important to understand the factors that have driven changes in equity prices. This article focuses on the movements in equity prices since the start of the financial crisis in Summer 2007. As background, the next section briefly outlines some different approaches to analysing equity

(1) The authors would like to thank Adrien Auclert, Colombine Peze-Heidsieck and Matthew Tong for their help in producing this article.
(2) This article covers the period up to the Monetary Policy Committee's interest rate decision in February. The data cut-off is therefore 3 February 2010.
(3) For further information, see Benford *et al* (2009).

Chart 2 UK real equity prices[a]



Sources: Global Financial Data Inc. and Bank calculations.

(a) Index as in footnote (a) of **Chart 1** deflated using the consumer prices index (CPI) as calculated by Global Financial Data Inc. Monthly averages.

prices. The following section then discusses the simple conceptual framework used in this article. The final two sections present the results of the analysis along with some sensitivity analysis.

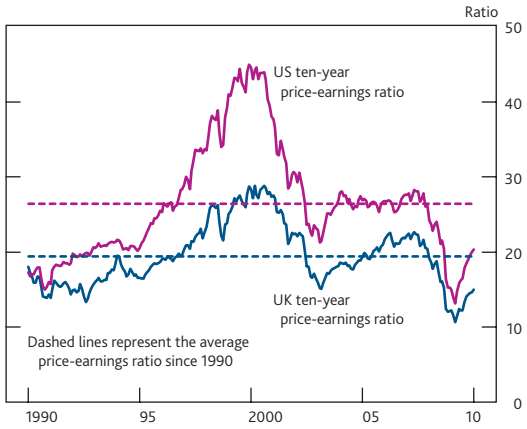
Interpreting equity price movements

There is a vast academic literature on methods for evaluating equity prices, as well as a variety of approaches used by practitioners. For example, behavioural finance theory suggests that psychological influences can affect the behaviour of investors and subsequently asset prices. Such influences include herding behaviour, where individual investors join the crowd of others in a rush to buy or sell assets (Brunnermeier (2001)), and so-called 'cognitive dissonance', where investors ignore information that conflicts with their prior expectations (Drees and Eckwert (2005)).

Many approaches, however, adopt a common foundation. They are based on the idea that the price of any asset should reflect the present value of its future stream of income, discounted using a risk-free rate plus an additional compensation that captures the risk of holding the asset — in the case of equities, the so-called equity risk premium. The extra compensation follows from investors' aversion towards risk. Investors require higher returns than the risk-free rate to hold assets that provide uncertain pay-offs and that tend to be positively correlated with the business cycle and with other assets.(1)

Among the simplest and best known of these approaches are the so-called 'ratio variables'. They generally express equity prices as a proportion of current or expected future income. These ratios are generally compared to their long-run averages to assess the most recent data against a historical standard. One of the most commonly used ratio variables is the price-earnings ratio which compares current equity prices to companies' earnings (**Chart 3**).(2) But ratio variables are very simplistic. For example, the price-earnings ratio generally uses past earnings rather than the expected future stream of income, and it also ignores changes in both the risk-free rate and the equity risk premium.

Chart 3 Price-earnings ratios[a][b]



Sources: Global Financial Data Inc., Thomson Datastream and Bank calculations.

(a) Monthly averages. The equity markets are proxied by using the following indices: FTSE All-Share for the United Kingdom and S&P 500 for the United States.
(b) As earnings vary considerably through the business cycle, the ratio of real equity prices to a ten-year trailing average of real earnings is used. The deflator used is the CPI as calculated by Global Financial Data Inc. for the United Kingdom and the Datastream CPI for the United States.

Instead, this article uses the so-called dividend discount model (DDM), which is a simple but flexible accounting framework that addresses some of these shortcomings. It is based on the notion discussed earlier that equity prices represent the risk-adjusted present value of the future cash flows that shareholders expect to derive from equities. An increase in expected future cash flows, holding everything else constant, should have a positive effect on equity prices. By contrast, a rise in the risk-free rate implies a higher rate at which future cash flows are discounted, and should have a negative effect on equity prices. Similarly, a higher equity risk premium should lead to a fall in equity prices. But while these components are treated separately in the model, in practice they are likely to be affected by common factors and so to be intrinsically linked (see Kiley (2000)).

An application of the dividend discount model

The DDM requires a number of inputs — namely expected future cash flows, the risk-free rate and the equity risk premium. These variables are however unobservable, so various assumptions and proxy measures are used instead. As a result, any conclusion drawn from the output of the DDM depends crucially on the plausibility of these assumptions and proxies, which could change over time. This section outlines

(1) The complexity of these approaches varies greatly from simple valuation measures to the evaluation of equities in a general equilibrium framework (Cochrane (2005)).
(2) For more detail, see Vila Wetherilt and Weeken (2002).

the baseline assumptions for the DDM used in this article. This model extends previous Bank work (Panigirtzoglou and Scammell (2002)) and is discussed in more detail in the annex.(1)

Expected future cash flows

Expected future cash flows are a function of the current level of cash flows and their expected future growth. As is common practice, this article makes two simplifying assumptions. First, current cash flows are proxied by dividends.(2) Hence, an increase in current dividends, holding everything else constant, should boost equity prices since cash flows are expected to grow from a higher level. Second, the ratio of dividends to earnings (the payout ratio) is kept constant going forward. So dividends are assumed to rise at the same rate as earnings.(3) This means it is possible to use projections for the growth in companies' earnings to capture changes in the expected future income stream derived from holding equities.

A further assumption often made is that the expected growth rate of dividends is constant. Although this assumption greatly simplifies the present value calculations, it may lead to misleading conclusions, particularly when economic prospects are changing dramatically such as over the past two years. Hence, this article extends previous Bank work and allows dividends growth to vary in the near and medium term before reverting back to a long-run growth rate.

Investors' earnings expectations are not directly observable, but over the short and medium term there exist surveys of analysts' expectations. Some of the most widely used survey-based measures for earnings expectations are published by the Institutional Brokers' Estimate System (IBES). These are consensus forecasts of quoted companies' earnings per share which can be used to generate earnings projections.

In contrast, it is hard to obtain publicly available estimates for earnings expectations over the long term. But long-term earnings can be proxied in a number of ways. One approach relates the expected future long-term growth rate to current and past observable variables. But while this allows the long-term growth rate to be calibrated within the DDM, it can sometimes lead to unrealistic results (see annex). An alternative is to express the long-term growth rate as a function of long-term forward interest rates such as overnight index swap (OIS) rates.(4) OIS rates will contain expectations of future interest rates, so they may be closely linked to the expected long-term growth rate of the economy. But long-term sterling OIS rates were relatively illiquid before mid-2008 and so may have provided a poor guide to expected future interest rates.

A simpler approach is to assume that the expected long-term growth rate is constant and equal to an estimate of the potential growth of the economy. This article uses this latter approach, while recognising that the choice is essentially arbitrary.

The risk-free rate

The risk-free rate is usually proxied by government bond yields, given that in general these are the safest long-term assets available to investors. In this article, the baseline case uses rates inferred from zero-coupon government bond yield curves at maturities up to ten years.(5) But other proxies for the risk-free rate could be used. One option is to use OIS rates after mid-2008; this will be discussed further in the sensitivities section later in the article.

The equity risk premium

The equity risk premium is also unobservable, but it can be extracted as a residual from the DDM using observed equity prices and the inputs already discussed. In other words, an implied level of the equity risk premium can at each point in time be backed out from the DDM using the observed level of equity prices and the inputs used for investors' expected future earnings and the risk-free rate. In this way, contributions to moves in equity prices due to shifts in the implied risk premium can be inferred.

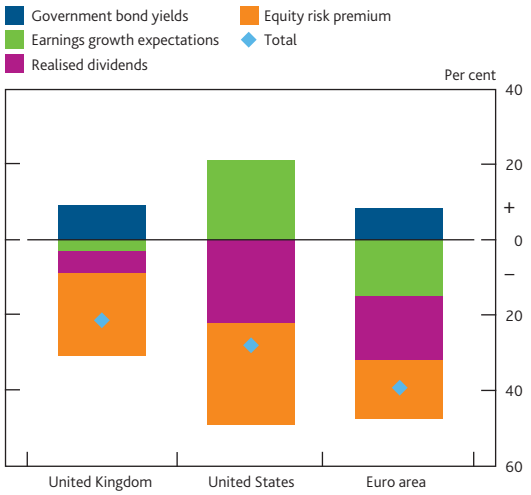
Accounting for recent large movements in equity prices

The DDM provides a framework to assess the factors that might account for the observed large movements in equity prices since mid-2007, prior to the start of the financial crisis. Based on the inputs discussed previously, **Chart 4** shows an indicative breakdown of the contributions to the changes in international equity prices between mid-2007 and early February 2010. The decomposition suggests that UK and euro-area equity prices have been supported by lower government bond yields. But, over the same period, realised dividends and earnings expectations have generally fallen, which other things equal would suggest a lower contribution to equity prices.(6) For all three indices, prices fell by considerably more than can be attributed to changes in the perceived outlook for earnings or government bond yields, suggesting that higher equity risk premia also probably played a role.

Although **Chart 4** provides useful insights into the total fall in equity prices since mid-2007, it does not address what could account for the large fall in equity prices to their March 2009 trough and their subsequent partial rebound (**Chart 5**).

(1) The model incorporates more detailed and new information on earnings prospects and the term structure of government bond yields.
(2) Companies can distribute their earnings to shareholders by paying dividends or by buying back shares (Wadhwani (1999)).
(3) Throughout this article the term 'earnings' refers to companies' annual net profits.
(4) For further information, see Joyce and Meldrum (2008).
(5) The model approximates the long-term interest rate used in the last stage of the DDM with the five-year, five-year forward rate.
(6) The positive contribution of earnings expectations for US equities may reflect a rebound from the larger fall in realised dividends.

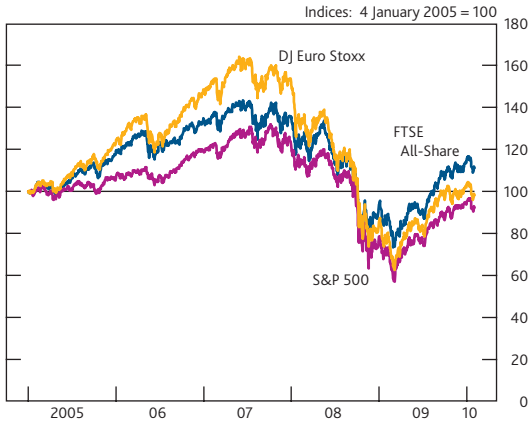
Chart 4 Indicative contributions to changes in international equity indices from 5 July 2007 to 3 February 2010[a][b]



Sources: Bank of England, Thomson Datastream and Bank calculations.

(a) The equity markets are proxied by using the following indices: FTSE All-Share for the United Kingdom, S&P 500 for the United States and DJ Euro Stoxx for the euro area. All are in local currencies.
(b) The above decomposition reflects the contribution of changes to individual variables in the model, scaled to match the total change in the equity index over the period.

Chart 5 International equity indices[a]



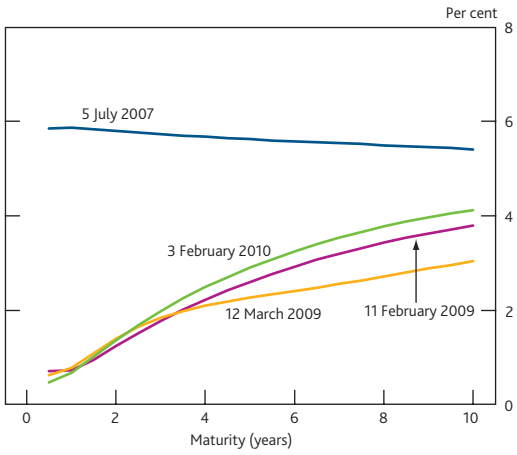
Sources: Thomson Datastream and Bank calculations.

(a) Local currencies.

The rebound in equity prices was preceded and accompanied by unprecedented policy actions to support monetary and financial stability. In the United Kingdom, for example, a number of measures were put in place to support the banking sector, including liquidity insurance, additional capital investment and asset protection schemes.(1)

In addition, the Monetary Policy Committee cut Bank Rate to historic lows and embarked upon a programme of asset purchases aimed at supporting nominal spending in order to keep inflation close to target. Besides purchasing private sector corporate debt securities, which were undertaken with the aim of improving the functioning of the UK commercial paper and corporate bond markets, the Bank of England's Asset Purchase Facility has purchased £198 billion of UK government bonds.(2) These purchases, together with the cuts in Bank Rate, are likely to have pushed down on government bond yields (**Chart 6**) and, other things equal, might have reduced the rate at which to discount future cash flows.(3) Indeed, government bond yields fell to be around their lowest levels since the mid-1950s. Moreover, it is likely that the policy actions helped to improve earnings expectations.

Chart 6 UK government nominal spot rates

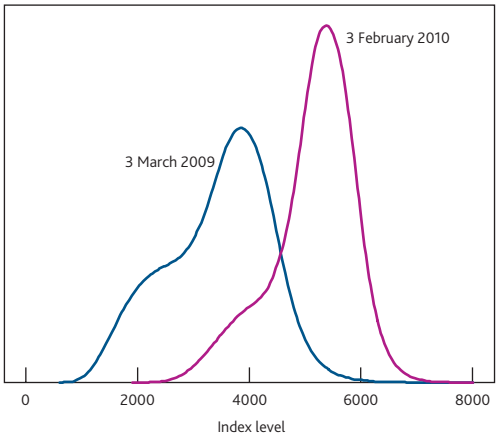


Market contacts have suggested that these policy actions by central banks and governments are likely to have prevented more severe downside risks from materialising. And the asset purchase scheme, along with those implemented by other countries, is likely to have encouraged investors to rebalance their portfolios away from government bonds towards riskier assets such as equities.(4) Each of these would have reduced the risk premium investors require to invest in equities, which appears consistent with information from option prices. For example, the implied distribution of future equity prices narrowed, implying that investors became less concerned about large future falls in equity indices (**Chart 7**).

However, the impact of those recent unprecedented policy actions cannot be precisely quantified. Therefore, it is difficult to draw firm conclusions about the relative contributions of policy to the factors that have driven changes in equity prices. Rather than focusing on the effect of these exceptional measures, the rest of this section looks into decomposing UK equity price movements in greater detail. It examines first the factors that drove the decline in equity prices up to March 2009, before moving on to consider what contributed to the subsequent recovery in equity prices. In doing so it focuses on three distinct periods:

(1) The UK Government has put in place an Asset Protection Scheme designed to protect financial institutions against exposure to exceptional future credit losses on certain portfolios of assets. For more details see Table 1.B on page 17 of the June 2009 *Financial Stability Report*, available at www.bankofengland.co.uk/publications/fsr/2009/fsrfull0906.pdf.
(2) For more details, see www.bankofengland.co.uk/markets/apf/index.htm.
(3) The price of bonds is inversely related to the yield. So a rise in bond prices is associated with lower yields.
(4) See Dale (2009).

Chart 7 Six-month option-implied FTSE 100 probability density functions[a]



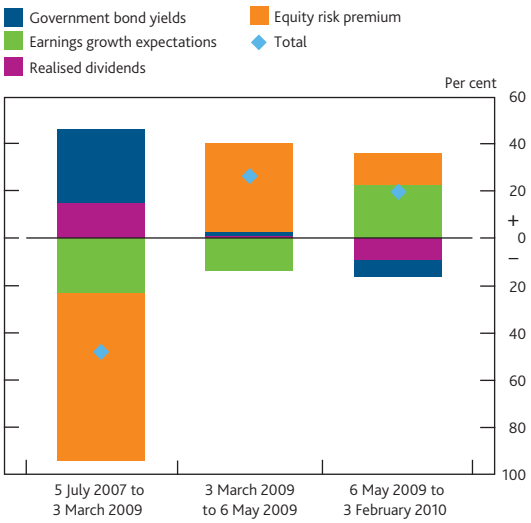
Sources: Euronext.liffe and Bank calculations.

(a) For more details, see Clews, Panigirtzoglou and Proudman (2000).

- 5 July 2007 to 3 March 2009;
- 3 March 2009 to 6 May 2009; and
- 6 May 2009 to 3 February 2010.

The indicative decomposition suggests that the fall in equity prices from the pre-crisis levels to the March 2009 trough can be accounted for by falling earnings expectations and higher equity risk premia, partially offset by lower government bond yields (**Chart 8**). The implied equity risk premium picked up markedly during the worst of the financial crisis in 2007–08, as investors became increasingly concerned about the risks associated with holding equities.

Chart 8 Indicative contributions to changes in the FTSE All-Share[a]



Sources: Bank of England, Thomson Datastream and Bank calculations.

(a) The above decomposition reflects the contribution of changes to individual variables in the model, scaled to match the total change in the equity index over the period.

The recovery in UK equity prices appears to have been a story of two halves. The period between March and May 2009, when the UK index increased by around 25%, seems to have been characterised by a falling risk premium, while earnings expectations decreased further. Since May 2009, earnings expectations have recovered, providing substantial support to equity prices, and the equity risk premium has fallen further.[1]

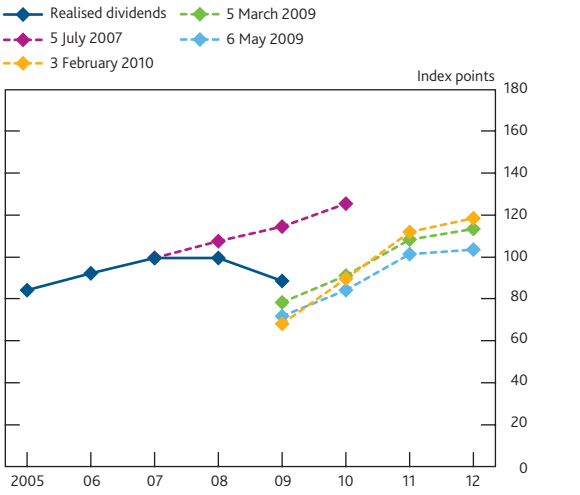
Sensitivity analysis

The results are sensitive to the different assumptions and proxies imposed on the model so applying the DDM in such a mechanical way could lead to misleading conclusions. Consequently, this final section uses some alternative proxies to assess the sensitivity of the results to the accuracy and timeliness of the DDM inputs.

Different proxies for earnings expectations

According to IBES figures, earnings expectations were revised downwards in the initial phase of the recovery in equity prices between March and May 2009 (**Charts 8** and **9**). But these earnings forecasts are imperfect proxies of expected cash flows. And evidence from academic studies and market intelligence suggest that they may lag actual changes in investors' expectations.[2]

Chart 9 Realised and projected dividends based on IBES earnings per share growth forecasts for the FTSE All-Share[a]



Sources: Thomson Datastream and Bank calculations.

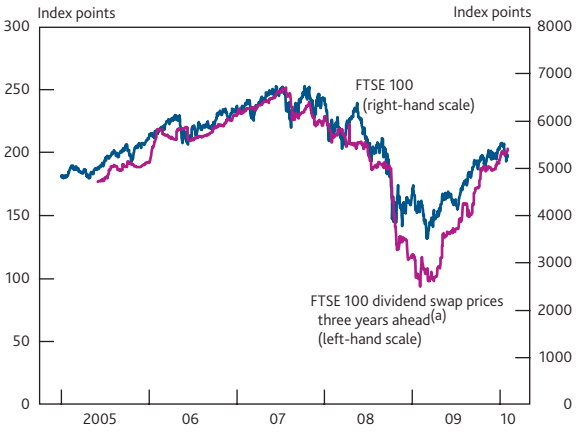
(a) Realised dividends for each year are extracted from the dividend yield ratio using the monthly average for December. Changes in dividends are generally announced following the release of companies' accounts. Hence, extracted dividends are likely to reflect changes in companies' performance with a lag. This may be a reason behind the wedge between the latest realised dividends and earnings expectations for 2009.

(1) The results can be sensitive to the precise specifications of the model. For example, using the DDM based on Panigirtzoglou and Scammell (2002), the December 2009 *Financial Stability Report* finds that lower real interest rates could account for some of the rise in UK equity prices since March 2009 (Bank of England (2009)).

(2) According to O'Brien (1988), the average reporting lag between analysts' forecast dates and IBES reporting dates is 34 trading days with a standard deviation of 44.5 trading days.

Dividend swaps — contracts that are directly linked to future dividends (see the box on page 30) — may provide an alternative proxy for investors' expected cash flows. After falling sharply in 2008, dividend swap prices rebounded in 2009, broadly consistent with the recovery in equity markets in March 2009 (**Chart 10**).(1) This contrasts with IBES forecasts, which continued to be revised downwards until May 2009.

Chart 10 FTSE 100 dividend swap prices and equity index



Sources: Barclays Capital, Bloomberg and Bank calculations.

(a) Calculated from a FTSE 100 three-year dividend yield index using the concurrent equity index level for simplicity. The swaps reference dividends paid in a calendar year between two and three years ahead.

If dividend swap prices were to be used in the DDM instead, downward revisions to earnings expectations might have accounted for a larger proportion of the fall in equity prices up to their March trough. And the contributions of a falling equity risk premium and higher earnings expectations could perhaps correspondingly be more balanced between the two recovery phases in 2009.

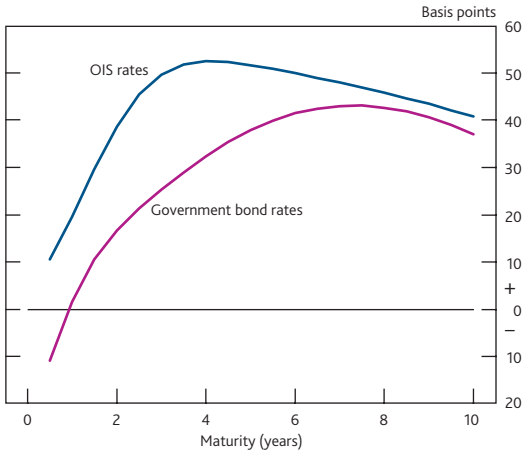
However, dividend swap prices may be affected by risk premia due to the uncertainty around future dividends, and could also contain liquidity premia, among other factors. The lack of longer-run dividend swap data complicates the task of estimating the scale of these risk premia. Hence, the rebound in dividend swaps in March 2009 may have been driven by either improved earnings expectations or a change in risk premia, or a combination of the two.

Alternative risk-free rate

The decomposition shown in **Chart 8** implies that lower nominal government bond yields mitigated some of the fall in equity prices from July 2007 to the trough.

But government bond yields may not provide a good proxy for the risk-free rate. For example, they may reflect other factors such as the supply of government bonds and investors' preferences. And the government bond market has been affected recently by unprecedented policy measures, including the Bank's Asset Purchase Facility. One option is to use OIS rates instead. But, as discussed earlier, long-term OIS rates are only available since mid-2008 so can only be used over the recovery phase. Since the trough in equity prices in March 2009, OIS rates have increased by more than government bond yields (**Chart 11**). This suggests that, were OIS rates to be used instead of government bond yields, the risk-free rate contribution would become more negative.

Chart 11 Changes in spot rates since 3 March 2009



Sources: Bank of England and Bank calculations.

Plausibility of equity risk premium

The implied equity risk premium is derived as a residual, and so depends crucially on the other model inputs. The model can be used to compare changes in the level of the equity risk premium over time. The baseline model suggests that the rise in the equity risk premium during the recent recession is similar to that following the equity price fall in 2001–03 (**Chart 12**).(2) That may appear surprising, given the severity of the financial crisis and the magnitude of the fall in UK and world output since the start of the recession.

One possible explanation is that expectations for UK-quoted companies' earnings were revised down more sharply during the recent period than earlier in the decade, reflecting the more severe domestic and global downturn (**Chart 13**).(3) This larger revision in IBES earnings forecasts during the recent period can therefore account for a greater proportion of the fall in equity prices. That in turn mechanically implies a smaller rise in the equity risk premium than would otherwise be the case. In addition, policy actions by both central banks and governments are likely to have reduced the likelihood of more severe downside risks to the economy materialising. And that will also have limited the extent of the rise in the equity risk premium.

(1) Dividend swaps are most commonly traded on the narrower FTSE 100 index, rather than the FTSE All-Share.
(2) As shown in **Chart 1** the two-year fall in UK equity prices in 2001–03 was similar to that in 2007–09.
(3) Indeed, in March 2009 IBES implied cumulative four-year earnings growth was the lowest since 1998, when data became available for the FTSE All-Share index.

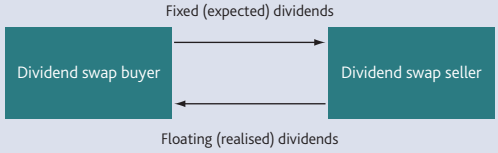
Dividend swaps

A dividend swap is a financial contract that is directly linked to the dividends paid by a specific equity or basket of equities. It has zero value at inception, and the final payment is determined by the actual, or realised, level of dividends paid over the time period specified by the contract (usually a calendar year).

Typically, dividend swaps have been traded 'over the counter' as private contracts between counterparties. However in June 2008, Eurex introduced exchange-traded dividend futures that reference the weighted aggregate level of dividends paid by the companies included in the DJ Euro Stoxx 50 index. And in May 2009 Euronext.liffe introduced similar dividend futures referencing the FTSE 100.

The mechanics of dividend swaps are similar to fixed-for-floating interest rate swaps. The buyer in a swap agrees to make a fixed payment at expiry, which embodies expectations of future dividends. The seller in the swap agrees to pay at that future date the realised dividends accrued over the period (**Figure 1**). Hence, the buyer of the swap makes a profit if the realised dividend is greater than the agreed fixed payment.

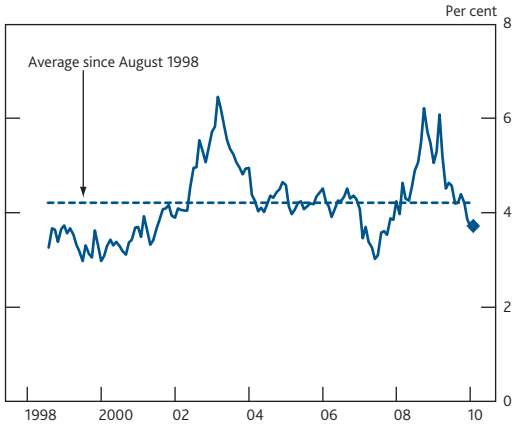
Figure 1



Generally, ordinary dividends accrued by companies in the reference index over the life of the swap are included in the pay-off. Other cash flows to equity holders, such as share buy-backs and large irregular dividend payments (so-called 'special' dividends) are typically excluded. Some contracts also exclude dividends paid as equity to existing equity holders.

As the present value of expected cash flows on the dividend swap changes over time, the price of the contract may fluctuate. Since the final payment is uncertain, the appropriate discount rate for the future cash flows will include an adjustment for risk. This means that the market price of the swap reflects not only investors' expectations about future dividends but also incorporates some compensation for the perceived uncertainty around those expectations. In addition, other factors such as liquidity premia could affect dividend swap prices.

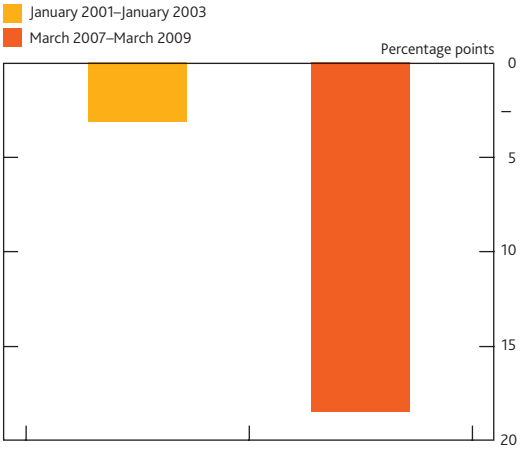
Chart 12 DDM implied equity risk premium for the FTSE All-Share since August 1998[a]



Sources: Bank of England, Thomson Datastream and Bank calculations.

(a) Monthly averages. Diamond represents point at 3 February 2010.

Chart 13 Changes in four-year cumulative growth in earnings per share forecasts implied by IBES forecasts for the FTSE All-Share[a]



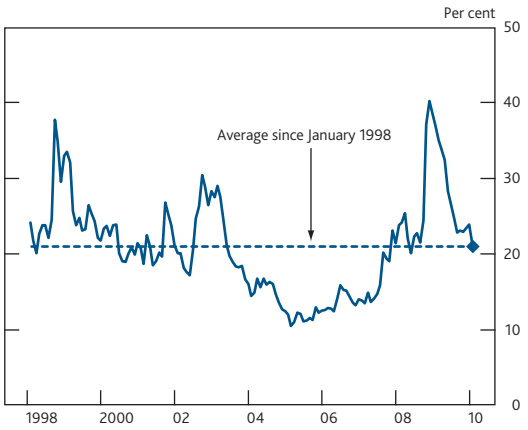
Sources: Thomson Datastream and Bank calculations.

(a) Change in IBES forecasts over the same periods as those used in **Chart 1**. Four-year growth based on 'year-on-year' IBES earnings per share growth projections for the first three years and the 'over-the-cycle' projection for the fourth year.

Alternative indicators of the equity risk premium can also help to assess the plausibility of the profile implied by the DDM. One such market indicator is option-implied volatility, which is often used as a proxy for market participants' uncertainty about future equity prices. However, measures of implied volatility and the model-implied equity risk premium are not directly comparable. For example, option-implied volatility captures the uncertainty over the maturity of the option (for example twelve months), whereas the model-implied risk premium captures the uncertainty over the whole life of equities, which can be thought of as perpetuity. Furthermore, options are most commonly traded on the narrower FTSE 100 as opposed to the FTSE All-Share.

Chart 14 shows the level of twelve-month FTSE 100 option-implied volatility. The sharp increase and subsequent fall of this measure towards its average since 1998 is broadly consistent with the changes in the implied level of the equity

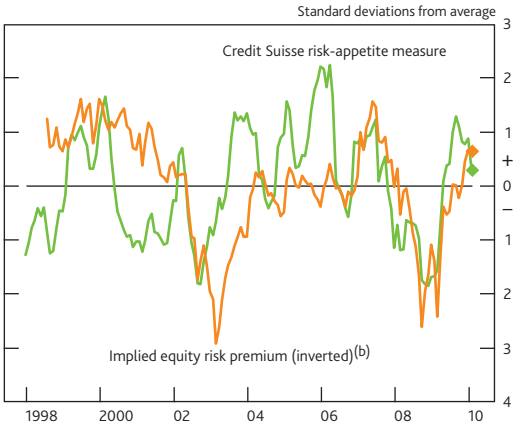
Chart 14 Twelve-month FTSE 100 option-implied volatility[a]



Sources: Euronext.liffe and Bank calculations.

(a) Monthly averages. Diamond represents point at 3 February 2010.

Chart 15 Investors' risk appetite and the FTSE All-Share implied equity risk premium[a]



Sources: Credit Suisse, Thomson Datastream and Bank calculations.

(a) Monthly averages. Diamonds represent points at 3 February 2010.
(b) Adjusted so that positive (negative) numbers indicate higher (lower) risk appetite.

risk premium. However, option-implied volatility increased to a higher level than that reached in 2002.

Another way of gauging whether the implied level of the equity risk premium is plausible is to compare it against a measure of investors' risk appetite, derived for example from an econometric model. Such a measure should be inversely correlated with the equity risk premium — when risk premia are lower (higher) risk appetite should be higher (lower). Measures of risk appetite are typically volatile and should be interpreted with caution. But the profile of the DDM-implied equity risk premium would seem to show a similar pattern to one such measure of risk appetite (**Chart 15**).

Conclusion

This article has discussed the factors that might help explain the large equity price movements observed over the past couple of years. It has used an extended dividend discount model to decompose the changes in equity prices into what might be attributable to changes in earnings expectations, government bond yields and shifts in equity risk premia.

On balance, it appears that a combination of factors can help explain the observed large equity price movements. First, changes in earnings expectations might account for a part of the observed equity price movements. Second, the excess return required by market participants to compensate for the risk of holding equities — the implied equity risk premium — picked up sharply during the worst of the financial crisis before falling back to around its average over the past eleven years. Third, policy actions are also likely to have had an impact by both lowering government bond yields and reducing the likelihood of more severe downside economic risks materialising, and thereby compressing the required equity risk premium. There remains substantial uncertainty about the precise role and timing of each factor. But all appear to have contributed to a varying degree to recent moves in equity prices.

Annex
Description of the dividend discount model

The dividend discount model (DDM) is based on the notion that equity prices should reflect the present value of the future expected stream of income, discounted using a risk-free rate (r) and an additional compensation that captures the risk of holding equities — the equity risk premium (erp). The future stream of income should capture the cash flows accruing to shareholders in the form of dividends and other pay-offs such as share buy-backs. But a common simplifying assumption (also used in this article) is to proxy the cash flows with dividends (D). In this framework, the fundamental value of an infinitely lived equity (P) is given by:

$$P_t = E_t\left[\frac{D_{t+1}}{(1+r_{t+1}+erp_{t+1})}+\frac{D_{t+2}}{(1+r_{t+2}+erp_{t+2})^2}+\ldots\right]$$
$$= E_t\sum_{i=1}^{\infty}\frac{D_{t+i}}{(1+r_{t+i}+erp_{t+i})^i}$$

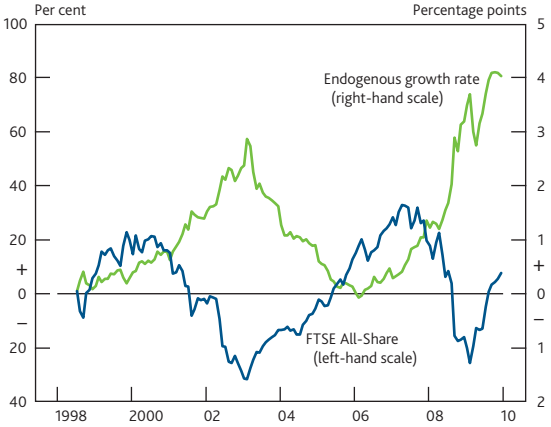
The DDM used in this article, which extends previous Bank work (Panigirtzoglou and Scammell (2002)), approximates the above equation. Dividends are assumed to move in line with expectations of future earnings. Dividend growth varies over the first four years, before reverting back to a long-run growth rate. The term structure of the equity risk premium is assumed to be flat.

This article extends the earlier model in two ways. First, the DDM in this article proxies the risk-free rate using government bond yields up to ten years, rather than assuming a flat term structure of interest rates. This article also uses nominal rates rather than real rates, thereby benefiting from greater data availability at shorter maturities and avoiding the need to transform IBES forecasts into real terms.

Second, the model incorporates more detailed information on earnings prospects. It includes 'year-on-year' IBES 'earnings per share' growth projections for the first three years and the 'over-the-cycle' IBES projection for the fourth year. By contrast Panigirtzoglou and Scammell (2002) used 'over-the-cycle' projections for all four years. 'Year-on-year' projections are based not only on a larger number of forecasts per company (on average 9 versus 1.5 over 2009) but they also cover a larger proportion of companies in the FTSE All-Share than the 'over-the-cycle' projections (70% versus 36% on average over 2009). Indeed market contacts consider the 'year-on-year' projections to be of higher quality than the 'over-the-cycle' forecasts.

This article adopts the simplifying assumption that the expected long-term growth rate of earnings is constant. It is possible to generate a long-term growth rate within the DDM by assuming that, over the long run, (i) companies' return on equity equals the cost of capital, and (ii) companies maintain a stable dividend policy and earn a stable return on investments.(1) But this 'endogenous growth rate' will change in line with the equity risk premium, which can lead to counterintuitive results. For example, the endogenous growth rate points to an unlikely sharp increase in long-term earnings expectations for UK-quoted companies during the worst period of the financial crisis (**Chart A**).

Chart A Changes in the endogenous long-term growth rate and FTSE All-Share since August 1998(a)



Sources: Thomson Datastream and Bank calculations.

(a) Monthly averages.

(1) See Panigirtzoglou and Scammell (2002) for the derivation of this endogenous growth rate.

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The Bank's balance sheet during the crisis

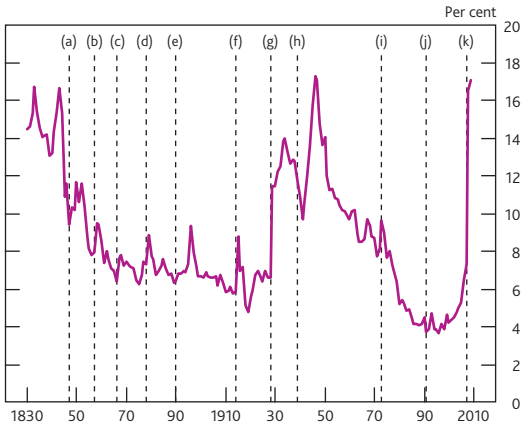
By Michael Cross of the Bank's Foreign Exchange Division, Paul Fisher, Executive Director Markets and Olaf Weeken of the Bank's Sterling Markets Division.[1]

This article sets out how monetary policy implementation and liquidity provision during the financial crisis have affected the size and composition of the Bank of England's balance sheet. It extends and updates a recent speech by Paul Fisher, Executive Director Markets, and describes the main components of the Bank's balance sheet prior to and during the crisis.

Introduction

The global economy has recently experienced the biggest financial crisis in history, and the United Kingdom, like many other advanced economies, has experienced its deepest recession for at least a generation. The responses from the monetary, fiscal and regulatory authorities across the world have been substantial and wide ranging. In particular, like central banks in other advanced economies, the Bank of England's operations to offer liquidity insurance to the banking system and to implement monetary policy have evolved rapidly during this period. That has resulted in a considerable expansion of central banks' balance sheets: as a proportion of GDP, the Bank's balance sheet is about as large as at any point in the past two centuries (**Chart 1**).

Chart 1 Bank of England balance sheet as a percentage of annual nominal GDP



Notes: The balance sheet observations are end-February for 1830–1966, end-year for 1967–2009.

Sources: ONS, www.measuringworth.org/datasets/ukgdp/result.php# and Bank calculations. A variant of this chart was originally published in a speech by Andrew Haldane (2009), 'Banking on the state'.

(a) Great Irish Famine/end of railroad boom (1847).
(b) Overextension of credit from 1855–66 (1857).
(c) Failure of Overend Gurney (1866).
(d) Failure of City of Glasgow Bank (1878).
(e) Support for Barings (1890).
(f) First World War (1914).
(g) Amalgamation of Treasury and Bank note issues (1928).
(h) Second World War (1939).
(i) Secondary Banking Crisis (1973).
(j) Small Banks Crisis (1991).
(k) Current crisis (2007).

The Bank's balance sheet — its assets and liabilities — enables the Bank to fulfil its core purposes, which are to ensure monetary stability and to contribute to financial stability. To understand the extraordinary measures the Bank has taken during the financial crisis, it is important to understand how the Bank uses its balance sheet to implement monetary policy and offer liquidity insurance to the banking system.

The next section describes the Bank's balance sheet prior to the crisis after a revised operational framework was introduced in May 2006. The article then describes how the Bank's balance sheet has evolved in the light of the changes to the Bank's operations during the financial crisis and summarises how the Bank has developed its management of the associated financial risks. The article concludes with an outlook on how the balance sheet is likely to develop when the extraordinary measures taken are eventually unwound.[2]

The Bank's balance sheet prior to the crisis

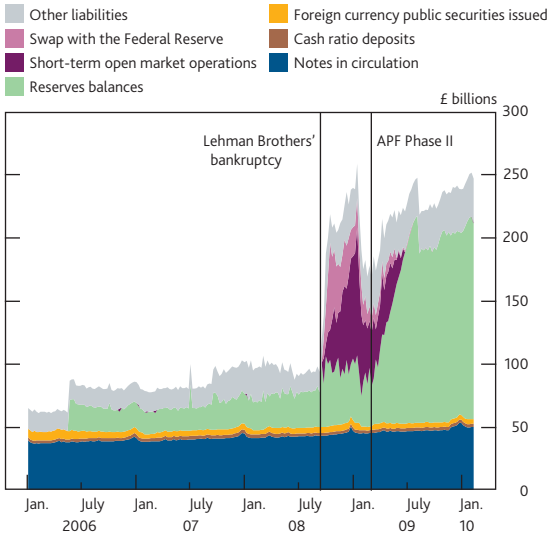
Like any other balance sheet, the Bank's balance sheet contains assets and liabilities. **Chart 2** and **Chart 3** show the development of the Bank's assets and liabilities since the start of 2006.[3]

The largest assets and liabilities

Chart 2 shows that the two largest items on the liability side of the Bank's balance sheet are the two components of central bank money — banknotes, and central bank reserves held by commercial banks at the Bank of England. Prior to the crisis,

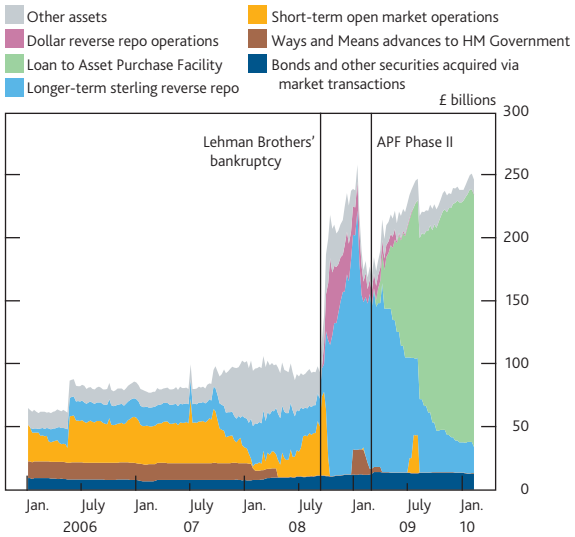
(1) The authors would like to thank Tarkus Frost and Matt Roberts for their help in producing this article.
(2) Fisher (2009) contains a timeline of the Bank's operations during the financial crisis.
(3) **Chart 2** and **Chart 3** show data up to 10 February 2010.

Chart 2 Bank of England consolidated balance sheet: liabilities(a)



(a) Excludes loans and associated deposits in course of settlement.

Chart 3 Bank of England consolidated balance sheet: assets(a)



(a) Excludes loans and associated deposits in course of settlement.

assets acquired in the Bank's open market repo operations were the main balancing items to the Bank's central bank money liabilities (**Chart 3**). These are described further below.

Notes

Among the Bank's liabilities are the banknotes used in everyday transactions (shown in blue on **Chart 2**). They are supplied on demand and are bought by commercial banks from the Bank of England at face value by debiting the purchaser's reserves account. Under legislation dating from 1844, banknotes and the assets backing them are held on a separate balance sheet — called Issue Department — while the Bank's other assets and liabilities, and capital held against them, are held on Banking Department. Because the existence of these two departments does not affect the impact of the Bank's operations on financial markets or the wider economy, this article focuses on the consolidated balance sheet of the two departments.

Central bank reserves

The other large liability on the Bank's balance sheet is central bank reserves balances, shown in green in **Chart 2**. Reserves balances are current account balances held by commercial banks at the Bank of England. Together with banknotes, these balances constitute central bank money. Reserves are a high-quality liquid asset for commercial banks to hold. In addition to purchasing banknotes from the Bank, commercial banks use reserves to make payments between each other.

Reserves balances are intrinsic to the Bank's implementation of monetary policy. So to understand how the Bank's balance sheet has changed during the crisis, it is important to understand the Bank's operational framework to implement monetary policy in normal circumstances. Before describing this operational framework, the next subsection describes some of the other items on the Bank's balance sheet.

Other assets and liabilities

Foreign exchange reserves

The institutional arrangements for exchange rate policy and foreign exchange reserves were set out as part of the new monetary policy framework introduced by the Government in 1997.(1) Under this framework, the government is responsible for determining the United Kingdom's foreign exchange rate regime. The government's official foreign exchange reserves are managed by the Bank as the government's agent. They are held in the Exchange Equalisation Account — an account of the government — and do not appear on the Bank's balance sheet.

But the framework also provides for the Bank of England to have its own separate pool of foreign exchange reserves. The Bank may use these foreign exchange reserves at its discretion to intervene in foreign exchange markets as part of its operating framework for meeting the inflation target which the Government sets for the Monetary Policy Committee (MPC). The MPC has not chosen to intervene in foreign exchange markets since the inception of the 1997 monetary policy framework.(2)

At approximately $6 billion, the size of the Bank's foreign exchange reserves is modest — around one tenth the size of the government's gross reserves. The Bank finances the acquisition of its foreign exchange reserves by issuing foreign currency securities in its own name in the international capital

(1) www.hm-treasury.gov.uk/press_40_97letter.htm.
(2) Intervention has been discussed on several occasions and those discussions were reported in the relevant minutes of the MPC meeting. See, for example, paragraph 41 in the minutes of the meeting held on 3–4 May 2000, available at www.bankofengland.co.uk/publications/minutes/mpc/pdf/2000/mpc0005.pdf.

markets (these liabilities are shown in yellow in **Chart 2**). The proceeds of this issuance are reinvested in high-quality, liquid securities that could be quickly realised should the MPC decide to intervene. These assets are shown as part of the dark blue section in **Chart 3**.

Ways and Means

'Ways and Means' is the name given to the government's overdraft facility at the Bank (shown in brown in **Chart 3**). Prior to the transfer of the government's day-to-day sterling cash management from the Bank of England to the Debt Management Office (DMO) in 2000, the outstanding daily balance varied significantly, reflecting net cash flows into and out of government accounts that were not offset by government cash management operations. After the transfer of cash management from the Bank to the DMO, borrowing from the Bank was not used to facilitate day-to-day cash management and the balance was stable at around £13.4 billion until the facility was repaid during 2008. The Bank and the Treasury agreed to this repayment in order to improve the Bank's ability to manage its balance sheet. The facility remains available for use and at the end of December 2008 HM Treasury borrowed temporarily from the Bank using the facility to fund the refinancing of loans that the Bank had earlier made to the Financial Services Compensation Scheme and to Bradford & Bingley.

Other items

Some of the Bank's capital and reserves are held in equity holdings, eg in the Bank for International Settlements and the European Central Bank and, of course, the Bank's physical assets. The remainder (the Bank's 'free' capital), together with non interest bearing cash ratio deposits placed with the Bank by UK-resident commercial banks, is predominantly invested in a portfolio of sterling-denominated securities. These assets are shown as part of the dark blue section in **Chart 3**.

The Bank also provides banking services for a small number of customers, mainly the UK Government and other central banks. These accounts appear as liabilities of the Bank and are backed by assets acquired in open market operations or by matching (secured) deposits in the market. They are part of the other liabilities and other assets shown in **Chart 2** and **Chart 3** respectively.

The Bank's sterling monetary framework from May 2006

A central bank's power to influence market interest rates derives from the banking system's demand for central bank money — notes and reserves — and the liquidity services it provides by being the ultimate means of settling payments. In normal circumstances, central banks tend to implement the desired monetary policy stance by changing interest rates (the price of central bank money) and supplying the quantity of reserves consistent with achieving this price. In such normal circumstances, the size and/or composition of the central bank balance sheet plays no independent role. As a result, balance sheet management mainly involves optimising the maturity match between assets and liabilities. The remainder of this section describes how the Bank managed its balance sheet prior to the onset of the crisis following the introduction of a revised operational framework — the sterling monetary framework (SMF) — in May 2006.

The SMF has been described in detail in previous speeches and Bank publications.(1) This article focuses on the main elements of the framework. The three main elements are: reserves, operational standing facilities and open market operations. In normal times, over a month as a whole, a commercial bank's reserves holdings are remunerated at Bank Rate so long as, on average, they fall within a range around the reserves target it has chosen. Individually, on any given day, banks have a choice between varying their reserves holdings at the Bank and transacting in the market. Commercial banks may also transact with the Bank of England, in unlimited amounts, in the Bank's operational standing facilities (for both lending and deposits), but they do so at a less favourable interest rate. Provided banks are able to transact in the market to meet their individual reserves targets, reserves averaging and operational standing facilities should keep overnight and other very short-term interest rates broadly in line with Bank Rate. But for the rate-setting objective to be met, the Bank needs to ensure that its (net) supply of reserves is in line with demand. That entails ensuring that sufficient reserves are provided through open market operations to allow banks to meet their collective target.

The introduction of a system of voluntary reserves, with reserves averaged over a maintenance period during which they are remunerated at Bank Rate, resulted in reserves balances of around £24 billion in May 2006. Subsequently, over each monthly maintenance period, aggregate reserves reflected the collective choices of banks and this component of the Bank's balance sheet expanded and contracted accordingly.

The approach by which commercial banks themselves decided how many reserves to hold, rather than having targets set for them by the central bank, was a uniquely distinctive feature of the SMF. The next section shows that the flexibility it provided was helpful to banks in managing their liquidity needs during the early part of the crisis.

Open market operations

The Bank uses open market operations (OMOs) to provide the reserves which banks need to meet their collective target. Together, they are ordinarily the balancing asset to match the

(1) See for example Bank of England (2008a,b), Clews (2005), Mac Gorain (2005) and Tucker (2004).

Bank's reserves account liabilities. Day-to-day flows across the Bank's balance sheet, including purchases and returns of banknotes, are reflected in so-called 'autonomous factors'. These autonomous factors affect reserves and therefore determine the size of required reserve injections.

Acquiring the assets backing the note issue and reserves could in principle exclusively be done via the Bank's short-term operations — lending central bank money against high-quality sovereign collateral securities in 'repo' transactions for a fixed term (typically one week). These operations are shown in yellow in **Chart 3**.

Effective and efficient implementation of monetary policy does not require the Bank to roll over its entire stock of financing every week in a repo of one-week maturity. While reserves have a relatively short maturity (since banks set their reserves targets each month), much of the banknote issue is expected to be long-lasting. In order to avoid an inefficient churn in its assets, the Bank started from January 2006 to invest part of the notes issue in assets with a longer maturity and offered long-term repo operations at three, six, nine and twelve-month maturities. These operations in which central bank money is lent against the same high-quality sovereign securities as in the Bank's short-term operations are included in the light blue area in **Chart 3**.(1) And, in January 2008, the Bank began to conduct purchases of UK government bonds, included in the dark blue area in **Chart 3**, as a device to match the maturity of the note issue with longer maturing assets.(2) These purchases were suspended following the MPC decision in March 2009 to purchase assets — including gilts — as part of the implementation of monetary policy.

The Bank's balance sheet since the start of the current crisis

The objectives of the Bank's operating framework are twofold. The first is to implement monetary policy by maintaining market interest rates in line with Bank Rate at maturities to the next MPC decision date. The second is to reduce the cost of disruptions to the liquidity and payments services supplied by commercial banks, via the provision of liquidity insurance balanced against the costs of creating incentives for banks to take greater risks.

The distinction between the two objectives is important in order to understand the Bank's response to the crisis. For monetary policy implementation, the main distinction to make is the period to March 2009 and the period since then, when policy has taken the form both of setting the MPC's interest rate and achieving its objective for asset purchases. For the Bank's liquidity insurance operations, the evolution was more continuous, although the pace of change accelerated in the period immediately after the intensification of the financial crisis in September 2008. The final changes are in the process of being implemented as a permanent feature of the Bank's operational framework.

On balance sheet liquidity insurance operations

The Bank's liquidity insurance operations and facilities have been at the heart of the Bank's response to the financial crisis. In common with other central banks, and sometimes in conjunction with them, the Bank has deployed a number of measures to provide liquidity insurance to, and so contribute to underpin confidence in, the banking system. At the height of the crisis, these resulted in a substantial increase in the size of the Bank's balance sheet.(3)

Extended collateral three-month repo OMOs

In response to the re-emergence of strains in term money markets towards the end of 2007, the Bank of England — along with other central banks — announced, on 12 December 2007, measures designed to address these pressures. Specifically the Bank announced changes to its long-term repo operations. The amount offered at three-month maturity was expanded and the range of high-quality collateral accepted at this maturity was widened from high-quality sovereign securities to include AAA-rated residential mortgage-backed securities (RMBS) and covered bonds.

Initially, these extended-collateral long-term repos (ELTRs) were offered in monthly auctions of £10 billion, with the sizes of subsequent auctions reflecting financial market conditions at the time. In particular, in the wake of the disruption to the global financial system in the autumn of 2008, these operations were offered in greater size and at greater frequency, and the range of eligible collateral was further expanded to include securities backed by commercial mortgage assets and corporate debt. At their peak during January 2009, the stock of outstanding ELTRs reached £180 billion (included in the light blue area in **Chart 3**).

US dollar repo operations

In response to liquidity pressures in dollar markets the Bank of England joined other central banks in offering to lend US dollars overnight, beginning on 18 September 2008. The Bank established a swap facility with the Federal Reserve to provide the funding for these operations (borrowing US dollars from the Federal Reserve Bank of New York and lending sterling in return), offering $40 billion initially. By late September, the immediate pressure had eased somewhat, but concerns remained about access to US dollar funding, especially over the quarter/year end. The Bank introduced a

(1) For more details about the injection of reserves via long-term repo OMOs see the box on page 22 of the 'Markets and operations' article in the Spring 2006 *Quarterly Bulletin*.
(2) For more details about the injection of reserves via bond-purchase OMOs see the box on pages 22–23 of the 'Markets and operations' article in the 2008 Q1 *Quarterly Bulletin*.
(3) The Bank can also provide emergency liquidity assistance (ELA). The impact on the Bank's balance sheet would depend on the form in which ELA is undertaken.

one-week operation to lend US dollars alongside its overnight operations. In mid-October, the central banks involved in US dollar operations announced that in order to provide broad access to liquidity, the existing variable-rate auctions of a fixed size would be replaced with fixed-rate operations of unlimited size.(1) The Bank began conducting additional operations at one-month and three-month maturities, with counterparties able to borrow any amount against the Bank's wider pool of eligible collateral. At its peak, the stock of US dollars provided through the Bank's operations reached about $86 billion. These assets are shown in pink in **Chart 3** and the proceeds of the swap with the Fed as a liability, in pink in **Chart 2**.

Pressures in US dollar markets receded by the middle of 2009, and so the Bank and other central banks announced the withdrawal of, first the overnight and then the one-month dollar operation and, in September 2009, of the three-month operation. Given the continued improvement in financial market functioning, the Bank, in co-ordination with other central banks, confirmed at the end of January 2010 the expiration of its temporary liquidity swap lines with the Federal Reserve on 1 February 2010.

Off balance sheet liquidity insurance facilities

The Bank launched two facilities to provide liquidity insurance to the banking system — the Special Liquidity Scheme (SLS) and the Discount Window Facility (DWF). As collateral swaps, the SLS and the DWF do not appear on the Bank's balance sheet and have no impact on reserves provisioning under the SMF. Nonetheless, these facilities were important elements of the Bank's response to the crisis, and so the next subsection discusses the key features of these facilities.

Special Liquidity Scheme

The Bank introduced the SLS in April 2008 to improve the liquidity position of the banking system by allowing banks to swap high-quality, but temporarily illiquid, mortgage-backed and other securities for UK Treasury bills. As the SLS was designed to deal with existing assets on banks' balance sheets following the unexpected closure of some asset-backed securities markets in 2007, only assets already on commercial banks' balance sheets at the end of 2007 were eligible collateral. Banks are required to pay a fee for the bills they borrow against this collateral.

SLS swaps may be renewed for a period of up to three years and are thus for longer terms than other central bank liquidity insurance operations. When the SLS was launched, the drawdown period was six months and so was due to close in October. In mid-September 2008, however, in view of the intensification of the financial system stress, the Bank announced an extension to the drawdown period for the SLS, to provide banks with additional time to plan their access to the Scheme in an orderly fashion. The drawdown window was extended to 30 January 2009. The last swaps under the SLS will therefore expire at the latest in January 2012, at which point the SLS will terminate.

After the closure of the drawdown period, the Bank announced in February 2009 that Treasury bills with a face value of approximately £185 billion had been lent under the Scheme. Given its scale, the Bank's operations in the SLS are indemnified by the Government.

Discount Window Facility

The Bank drew on a number of the features of the SLS in designing a new, permanent bilateral liquidity insurance facility, the DWF, which was launched in October 2008. Under the DWF, banks may borrow gilts against a wide range of collateral, at fees reflecting the type of collateral and the size of drawing. The terms were designed to be consistent with avoiding creating incentives for commercial banks to take greater liquidity risk in future. And they were also designed to protect the Bank itself against risk to its balance sheet.

Transactions under the DWF will normally be for 30 days. However, in recognition of continuing stresses in financial markets, the Bank announced in January 2009 that, for an additional fee of 25 basis points, it would temporarily permit drawing from the DWF with a maximum term of 364 days.

The Bank is considering further widening the collateral eligible for use in the DWF, subject to the basic principle that the Bank must be able to value the underlying assets, and manage the associated risks.

The implementation of monetary policy

Developments between Summer 2007 and March 2009

In the stressed market conditions that prevailed from Summer 2007, and until the MPC introduced asset purchases in March 2009, the flexibility inherent in the SMF, and use by the Bank of the contingency measures built into the framework, were the means of meeting the objective of implementing monetary policy. Commercial banks that were members of the reserves scheme continued to set their reserves targets at the beginning of each monthly maintenance period, and the Bank continued to ensure that the net supply of reserves through its operations matched banks' demand.

The Bank's balance sheet, however, expanded over this period. Initially, this principally reflected increased commercial bank demand for reserves given stresses in bank funding markets. Banks increased their aggregate reserves targets from £16 billion in July 2007 to a peak of £45 billion in December 2008. At times during this period, there appeared to be sudden changes in banks' demand for reserves within a

(1) This was facilitated by a change to US law permitting the US Federal Reserve to pay interest on reserves balances.

maintenance period — that is between their monthly opportunity to reset their targets. The Bank responded by injecting additional reserves beyond those needed for banks to meet their existing targets, via exceptional fine-tuning operations. To ensure that the banking system as a whole could hold the additional reserves without financial penalty the Bank adjusted the range within which reserves were remunerated.

As described above, some of the Bank's operations also injected reserves into the banking system. The approach of setting the net supply of reserves equal to banks' aggregate voluntary targets therefore required the Bank to drain any excess reserves injected in this way. In the autumn of 2008 the provision of reserves via the Bank's ELTRs exceeded the capacity of the Bank's existing tools to drain these reserves at shorter maturities and so bring the net supply of reserves into line with the aggregate target banks had set. As a result, the Bank created a new instrument — the Bank of England bill (a non-monetary liability offered generally weekly and with a maturity of one week) — to drain the additional long-term reserves provided. At their peak, over £100 billion of bills were issued on 8 January 2009.

Overall, for the period until the March 2009 MPC meeting, the Bank's operational framework for implementing monetary policy remained unchanged.

Developments since March 2009

At its meeting on 5 March 2009, the MPC reduced Bank Rate by 0.5 percentage points to 0.5%. At that level, the MPC judged that Bank Rate was effectively at (or very close to) its lower bound. To provide further monetary easing, the MPC announced that the Bank would undertake a programme of asset purchases financed by the issuance of central bank reserves. The aim of these asset purchases was to boost the rate of growth of nominal demand to ensure inflation meets the 2% inflation target in the medium term.

By the start of February 2010, purchases of £200 billion had been made under the programme. The vast majority of the assets purchased have been gilts. On 4 February 2010 the MPC voted to maintain asset purchases financed by the issuance of central bank reserves at £200 billion.

The working of the Asset Purchase Facility (APF) has been described elsewhere.(1) But to understand how the APF impacts the Bank's balance sheet the role of the Bank of England Asset Purchase Facility Fund is important.

The Bank of England Asset Purchase Facility Fund

In January 2009, under a remit from the Chancellor of the Exchequer, the Bank established a subsidiary company, the Bank of England Asset Purchase Facility Fund, with the initial objective of improving the liquidity of the corporate credit market by making purchases of high-quality private sector assets. The accounts of the Fund — which is indemnified for losses by the Government — are not consolidated with those of the Bank. But the Fund is financed by loans from the Bank shown in green in **Chart 3**.

In the initial phase, the Bank's loans to the Fund were financed by the issuance of Treasury bills by the DMO. In March 2009 the remit was extended to allow the MPC to use the APF to make purchases of assets — including gilts — for monetary policy purposes. During this period and until the February 2010 MPC meeting, the Bank's loans were financed by the issuance of central bank reserves. That increase in reserves is shown in green to the right of the line labelled APF Phase II in **Chart 2**.

The additional reserves created to finance the asset purchases were considerably in excess of those required to meet the voluntary targets banks set each month. Hence significant elements of the SMF were suspended: commercial banks ceased to set reserves targets and the Bank has, since March 2009, remunerated all reserves balances at Bank Rate.

Collateral management

The expansion and change in the composition of the Bank's balance sheet shown in **Chart 2** and **Chart 3** went hand in hand with a significant change in the risk characteristics of the balance sheet.

The widening of collateral accepted in long-term repo operations, and the introduction of the SLS and DWF, meant that the collateral associated with the Bank's balance sheet and off balance sheet items moved towards higher-risk assets, notably structured products such as asset-backed securities (ABS) and covered bonds.

As a result, the Bank had to build up its capacity to manage new types of risk. In particular, the Bank has undertaken extensive work to establish risk management processes around the securities accepted as collateral in its operations and facilities. This has included the establishment of a dedicated collateral management team. The team includes staff hired from the private sector with relevant expertise, and the Bank has drawn on external advice when necessary.

Credit ratings from the rating agencies generally form part of the published high-level eligibility criteria for collateral that the Bank accepts in principle in its operations and facilities. But when assessing the eligibility of collateral for its operations and facilities, the Bank also undertakes its own independent analysis. Based on that assessment, the Bank may reject

(1) For more information, see Benford *et al* (2009).

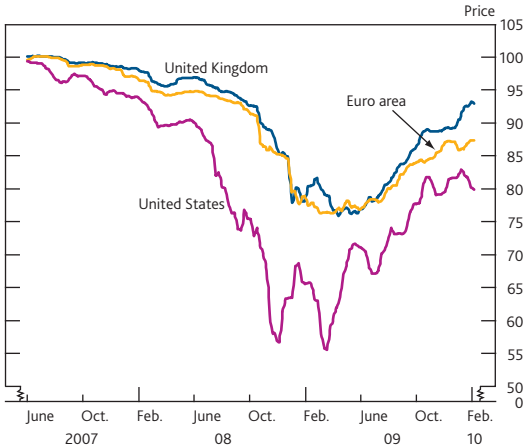
securities offered as collateral even if they have ratings that would otherwise make them eligible for the Bank's operations and facilities. Conversely, in the event of a downgrade below a minimum credit ratings criterion, the Bank may allow collateral to remain eligible, having considered the circumstances behind the rating action and the quality of the collateral.

An important tool that the Bank uses to mitigate the risk associated with the collateral it has accepted in its operations and facilities is the application of collateral 'haircuts'. That is, the Bank takes collateral with a market value in excess of the amount that the Bank will lend in return. These haircuts vary according to the attributes of the assets. The Bank's haircuts are designed to protect against loss in the event that a counterparty that has pledged the collateral to the Bank were to default. The Bank considers in particular the impact of scenarios on structured products that other stress tests may not cover, including so-called 'jump-to-default' scenarios in which a counterparty that has pledged collateral defaults with little prior warning. Collateral haircuts are reviewed on a regular basis, for example, the Bank recently changed the haircuts applied to its sovereign collateral having taken account of changes in market volatility over time.(1)

Given the potential for market prices to move each day and the large swings experienced in the past (**Chart 4**), the Bank revalues collateral on a daily basis and will call for more collateral if the market value of the collateral is no longer sufficient to cover the exposure as adjusted by the haircut. To deal with illiquidity in ABS markets the Bank has developed its own methodology for the valuation of securities where no market price is available.

In terms of its on balance sheet assets, as a result of the APF, the Bank now has outright exposure to a range of high-quality corporate issuers. While issuers must meet minimum ratings requirements the Bank also undertakes its own independent credit risk analysis.

Chart 4 UK, US and euro-area RMBS prices(a)



Sources: JPMorgan Chase and Co., UBS Delta and Bank calculations.

(a) Weekly moving average prices weighted by outstanding amounts. Agency RMBS is excluded from the US average.

The transition of the balance sheet to a post-crisis world

Eventually, as the extraordinary liquidity insurance operations and the monetary policy operations are unwound, the size of the Bank's balance sheet will shrink and its composition change.

Liquidity insurance operations

Of the liquidity insurance operations described above, some will be temporary, while others will be permanent.

For example, the Bank's US dollar operations were intended to be a temporary measure in the context of exceptionally stressed market conditions and have now ended as these stresses have abated. The SLS — which will terminate at the end of January 2012 — is also a temporary measure to enable banks to swap high-quality assets that became illiquid in the period of greatest market stress for UK Treasury bills.

On the other hand, ELTRs and the DWF are intended to be permanent features of the SMF. Indeed, the DWF was perhaps the most significant development in the Bank's operational framework during the crisis. When acting to alleviate financial system stress, central banks have traditionally been prepared to lend to commercial banks against a wider population of good-quality collateral. In launching the DWF, the Bank took the decision that it could be more transparent about the collateral it is prepared to take in this new, permanent public facility.

The use market participants make of ELTRs and the DWF will reflect two factors: the prices the Bank sets and — in the case of the ELTRs — the amount the Bank decides to offer the market.

In the ELTRs the Bank sets a minimum spread for bids against the extended collateral set. This is set at a level such that it is less attractive to participate in the Bank's operations than to finance the collateral in the private repo markets in non-stressed conditions. In the autumn of 2008, the Bank consulted on further changes to the ELTR framework, which would provide better incentives for commercial banks to manage liquidity risk prudently, while providing greater liquidity insurance in periods of financial stress. These are planned to be introduced in 2010.

Similar principles apply to the DWF. Unlike the extended collateral repos, the DWF is available on demand. The amount

(1) www.bankofengland.co.uk/markets/marketnotice090925.pdf.

borrowed is determined by the counterparty, but at prices and on conditions determined in advance by the Bank. The prices are a function of the collateral type offered by the counterparty, and the amount of the counterparty's borrowing; and they increase as banks' borrowing increases, and/or is made against less liquid collateral. Even at low levels of borrowing, however, the pricing structure is designed to be more expensive than is available in private markets in non-stressed circumstances. In this way, the pricing schedule for the Bank's provision of liquidity insurance is carefully balanced against the cost of the existence of insurance creating incentives for banks to take excessive liquidity risk.

Monetary policy operations

When the time comes for the MPC to tighten monetary policy, it will be able to do so either by raising Bank Rate, selling assets back to the market, or by some combination of the two. If assets are sold, reserves balances will fall accordingly and that will tend to cause the overall size of the balance sheet to contract. The Bank can also drain excess reserves independently (eg by issuing Bank bills).

However, the overall size of the balance sheet may not return to pre-crisis levels. For example, commercial banks may choose to hold persistently higher reserves balances than before the crisis. One motivation for this might be to help meet the more demanding liquidity requirements recently proposed by the Financial Services Authority.

The Bank has also recently expanded the range of banks that are eligible to hold reserves accounts, to include smaller banks in order to help them to manage their liquidity. This potentially adds around 200 commercial banks as Bank counterparties. Although the combined reserves balances of these banks will be small relative to the reserves balances of the Bank's existing counterparties prior to the crisis, this is an important extension to the range of banks that is able to access the Bank's market-wide facilities.

Independent of the operation of monetary policy, the Bank will continue its schemes to support the operation of the financing markets for corporate debt for as long as they are judged to be necessary. Since the MPC's decision on 4 February 2010 to maintain the stock of asset purchases financed by the issuance of central bank reserves at £200 billion, purchases of corporate debt have once again been financed by the issue of Treasury bills and the DMO's cash management operations.

Conclusion

The significant recent expansion of the Bank's balance sheet has been a necessary response to the extraordinary circumstances in global financial markets and the global economy. It reflects an expansion of both the Bank's liquidity insurance operations, and more recently the addition of asset purchases as an operating objective of the Monetary Policy Committee.

By their nature, the size of the liquidity insurance operations, which have already diminished, will continue to shrink as economic and financial conditions return to more normal times. The Bank has, in its permanent facilities, set pricing schedules that will be unattractive to banks in unstressed market conditions, because banks are expected to fund themselves in private markets, not via the central bank's balance sheet. So banks have a clear incentive not to use the Bank's liquidity insurance operations as conditions normalise.

Similarly, the expansion of the Bank's balance sheet as a consequence of the MPC's asset purchases will in time be reversed as monetary policy is tightened. Over time, the size of that part of the Bank's balance sheet attributable to the SMF will revert to being a function of the size of the banknote issue and commercial banks' demand to hold reserves at the central bank.

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Changes in output, employment and wages during recessions in the United Kingdom

By Renato Faccini and Christopher Hackworth of the Bank's Structural Economic Analysis Division.[1]

Employment has fallen during this recession but by much less than the fall in output. This article examines how the behaviour of the labour market compares with previous recessions. A number of factors, including greater flexibility in real wages, may have helped to mitigate the fall in employment to date. But there is considerable uncertainty about how the labour market will evolve.

Introduction

The evolution of the labour market during the recent recession will be a key determinant of the pace of the recovery. It will affect households' labour income, and hence prospects for spending. It will also affect businesses' total labour costs, their supply potential, and hence pricing decisions. As a result, it is important that policymakers monitor developments in the labour market, and understand the drivers of changes in employment and wages.

Over the past two years, UK output is estimated to have fallen by 6% — a much larger decline than experienced during the two previous recessions, at the start of the 1980s and 1990s. By contrast, employment has fallen less than experienced during those episodes (**Table A**).[2] And real wages — nominal wages per hour worked relative to the prices that businesses receive for their output — have risen by less than in previous recessions.

Table A Output, employment, hours and wages during recessions[a][b]

Per cent

	1980s	1990s	2000s
GDP[c]	-4.7	-2.5	-6.2
Employment[d]	-2.4	-3.4	-1.9
Average hours[e]	-3.0	-1.9	-2.2
Real hourly wages[f]	2.7	7.3	0.1

Source: ONS (including the Labour Force Survey (LFS)).

(a) Recessions are defined as two consecutive quarters of falling output (at constant market prices) estimated using the latest data. The recessions are assumed to end once output began to rise.
(b) Cumulative change during each recession.
(c) Chained-volume measure at market prices.
(d) LFS employment.
(e) Constructed as LFS total hours divided by LFS employment.
(f) Calculated using the National Accounts measure of compensation of employees. Converted into a real per hour measure using the gross value added deflator and LFS total hours worked.

This article considers some factors that might help explain the different response of the labour market now. The first section contrasts the recent behaviour of the labour market with that during the early 1990s. The second section examines how changes in the structure of the UK economy since the early 1990s may have affected labour market behaviour. The third section looks then at the role of other factors — specific to the recent recession — that are likely to have affected businesses' and employees' decisions about employment and real wages.

The adjustment in the labour market is, however, ongoing and there is considerable uncertainty about how it will evolve. The final section considers the risks to the employment outlook. Contacts of the Bank's Agents around the United Kingdom have reported that they expected headcount to remain broadly stable over the coming months, notwithstanding the anticipated recovery in output. But the picture may change over time. If output recovers more rapidly than businesses have anticipated, then employment may start to recover. But if, for example, the recovery in demand is more sluggish than businesses expect, or more businesses are forced into liquidation, then there is a risk that employment could fall further.

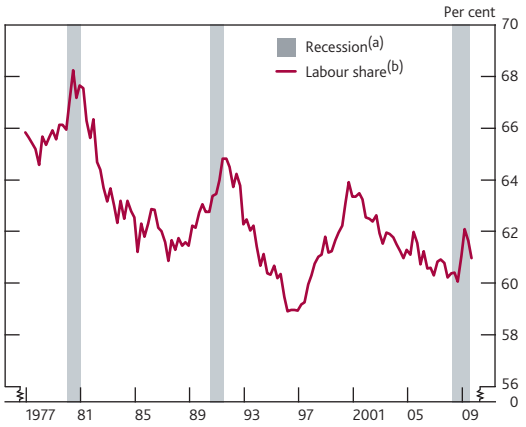
How has the labour market responded?

For the share of national income going to employees to be stable over time, real wages would need to grow in line with labour productivity. This has largely been the case since the 1980s, with employees' share of income — the labour share — hovering just above 60% (**Chart 1**). But the labour share has

(1) The authors would like to thank Philip Bunn, Varun Paul and Rachana Shanbhogue for help in producing this article.
(2) Some of the strength in employment has reflected rising public sector employment. But private sector employment has also fallen by less relative to output than in the previous two recessions.

fluctuated with the economic cycle. In particular, it has tended to rise during recessions with businesses' labour costs falling by an insufficient amount to offset the fall in output.(1)

Chart 1 Labour share of income



(a) Recessions are defined as in **Table A**.
(b) The labour share is based on whole-economy compensation of employees divided by nominal gross value added at factor cost.

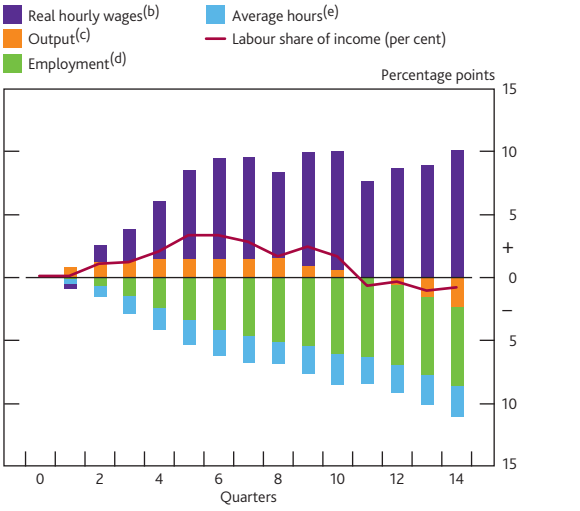
The rise in the labour share during the recent recession — and hence the fall in the profit share — looks broadly similar to that in previous recessions. That might be surprising given the recession has been both deeper and longer. But businesses have responded to the fall in output by reducing total labour costs by a similar proportion to that in the early 1990s.

The manner in which businesses have reduced labour costs, however, is very different. During the early 1990s recession, real wages per hour worked increased sharply (the purple bars in **Chart 2**). In order to contain labour costs, businesses reduced the number of people they employed sharply (the green bars).

The manner in which businesses have responded to the falls in output during this recession looks rather different (**Chart 3**). Real wage per hour growth has been weaker than in the early 1990s. This has meant that employment has fallen by less despite a larger fall in output (the orange bars). Nevertheless the labour share has still risen, and by a similar scale to the early 1990s.

In contrast to the behaviour of employment and real wages, average hours (shown by the light blue bars) appear to have behaved in a broadly similar manner to the early 1990s.(2) For example, the number of employees reporting that they are working shorter hours for economic reasons or than they desire has risen by a similar amount (**Chart 4**).(3) Although the falls in average hours appear similar to the 1990s, the effects may be both widespread and significant. For example, the Bank's Agents report that over three quarters of businesses had made use of flexible working practices in order to reduce labour costs, including freezing pay and reducing overtime.(4)

Chart 2 Contributions to cumulative changes in the labour share since 1990 Q2(a)



Source: ONS (including the Labour Force Survey).

(a) Labour share defined as in **Chart 1**.
(b) Calculated using the National Accounts measure of compensation of employees. Converted into a real per hour measure using the gross value added deflator and LFS total hours worked.
(c) Chained-volume measure of gross value added at factor cost.
(d) LFS employment.
(e) Constructed as LFS total hours divided by LFS employment.

Chart 3 Contributions to cumulative changes in the labour share since 2008 Q1(a)

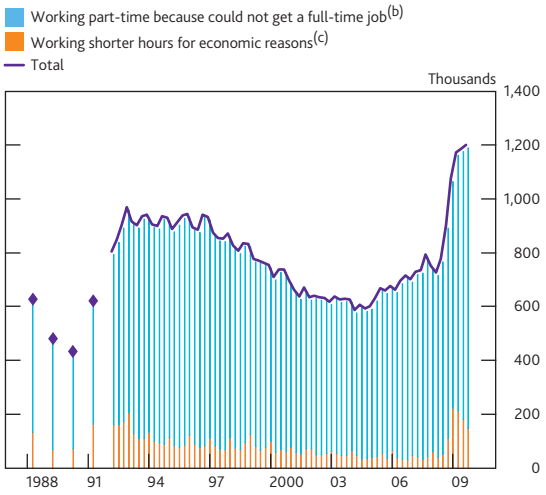
Source: ONS (including the Labour Force Survey).

(a) Variables are defined as in **Chart 2**.

Despite the different underlying forces pushing up the labour share, it is likely that it will need to continue to fall back, as in previous recessions. That could occur through weaker real

(1) Macallan and Parker (2008) find that businesses' profit margins do tend to contract as the degree of spare capacity increases.
(2) In part, the decline in average hours over time reflects a structural increase in the proportion of part-time workers in employment.
(3) Using more comprehensive data, Walling and Clancy (2010) estimate that the number of people looking for an additional job, or one with longer hours, increased by 26% in the year to 2009 Q3, to 2.8 million. But these data are not available early enough to allow a comparison with the early 1990s recession.
(4) For a detailed discussion of the Agents' survey results, see the box on page 5 of the October 2009 *Agents' summary of business conditions*, available at www.bankofengland.co.uk/publications/agentssummary/index.htm.

Chart 4 Individuals working shorter hours for economic reasons[a]



Source: ONS (including the Labour Force Survey).

(a) Data are not seasonally adjusted. Between 1988 and 1992 the LFS was annual. The annual observations correspond to the March-May quarter.
(b) Respondents to the LFS questionnaire who report that they are working part-time because they 'could not find a full-time job'.
(c) Respondents to the LFS questionnaire who report that they are working fewer hours than usual because of 'economic or other' causes. This excludes those who are working part-time because they could not find a full-time job.

wage growth, a recovery in output, or through further falls in employment in the future. The manner of the adjustment would depend in part on the factors that have influenced the different behaviour of the labour market in this recession, which the remainder of this article will go on to examine.

The next section explores how changes in structural factors — such as the monetary policy framework, the level of employment protection and the degree of unionisation — may have affected the behaviour of the labour market. The subsequent section explores the impact of other, concurrent influences on the economy, including the impact of changes in labour supply, the depreciation of sterling, and increased forbearance by businesses' creditors. The final section examines the risks to the employment outlook.

Changes in the economy since the early 1990s

This section explores how changes in the structure of the economy since the early 1990s may help to explain the different behaviour of the labour market during the recent recession. If real wages are more flexible, or if it has become more expensive to manage headcount, then businesses may not shed labour as much as in the past when demand weakens. Different expectations about the pace of recovery relative to the early 1990s — both on the part of businesses and employees — could also have affected employment decisions.

Macroeconomic policy environment

The number of people that a business wishes to employ depends not only on how much it wishes to produce but also on the costs of employment. One of the main costs is the real wage that a business pays its employees. But the evolution of real wages will reflect changes in both the nominal wage a business pays and the price it receives for its output. It is possible therefore that the relative weakness of real wages in this recession — or the relative strength in the early 1990s recession — reflects particular developments in nominal wages and prices.

Prior to the early 1990s recession, both nominal wages and prices were growing rapidly (**Chart 5**). Subsequently, both slowed over time, falling below 4% by 1993, as changes in macroeconomic policy generated a more stable nominal environment. But inflation fell more rapidly than nominal wage growth, pushing up real wages. That could have reflected the frequency with which prices are changed relative to wages. For example, Bunn and Ellis (2009) found that, on average, output prices are changed around once every four months whereas the vast majority of wages are renegotiated only once a year. The resulting upward pressure on real wages may have been a factor contributing to businesses reducing employment levels (see the previous section).

Chart 5 Employers' labour costs, output prices and households' inflation expectations

Sources: Barclays Capital and ONS (including the Labour Force Survey).

(a) Recessions are defined as in **Table A**.

In contrast, prior to the recent recession, inflation was low and stable and nominal wage growth was running at a pace broadly consistent with inflation at target. So there was less of a need for a significant adjustment in the growth of both nominal wages and prices compared with the early 1990s. That may be one reason why more recently real wage growth has been weaker, and employment stronger.

Structural changes in the labour market

Another candidate explanation for the relatively small fall in employment, so far at least, is that there has been a more flexible response on the part of businesses and their

employees. Businesses may have shown increased willingness to accept lower productivity for a period during this recession. And employees might have accepted weaker real wages in return for maintaining employment.

Empirical evidence is consistent with a structural change in the UK labour market during the 1990s. Since the mid-1990s, it appears that businesses have been increasingly likely to change hours and real hourly wages relative to their likelihood of changing the number of people they employ: the volatility of both average hours and real hourly product wages has risen markedly since the 1990s recession relative to the volatility of employment (**Table B**). At the same time, the volatility of employment relative to output has halved during 1994 Q1–2009 Q4, compared with 1975 Q1–1993 Q4. That suggests that the different behaviour of employment, hours and real wages observed in this recession might, at least to an extent, reflect structural changes in the labour market that predated the recent recession.(1) The remainder of this subsection considers what factors may have led to a change in this relationship.

Table B Labour market volatility(a)

	Employment to GDP	Average hours to employment	Real wages to employment
1975 Q1–2009 Q4	0.75	0.53	1.20
1975 Q1–1993 Q4	0.87	0.47	1.10
1994 Q1–2009 Q4	0.41	0.86	1.81

Source: ONS (including the Labour Force Survey).

(a) **Table B** reports the relative standard deviation of the cyclical component of the logged series of employment, output, average hours and real hourly wages. The series were filtered using a Hodrick-Prescott filter with smoothing parameter 1600.

Hiring and firing costs

In addition to real wages, businesses face a number of other costs when deciding how many people to employ. If the costs of adjusting headcount — such as redundancy payments or hiring costs — have increased relative to the costs of adjusting hours or pay, that could help explain why employment responded by less relative to output during the recent recession.

Businesses can incur significant costs when they reduce the number of people they employ. For example, the CBI estimates that the average redundancy payment is around £12,000, slightly less than 50% of the mean annual salary. Reports from the Bank's Agents around the United Kingdom suggest that businesses had been reluctant to make large-scale reductions in employment during the recent recession, in part reflecting the significant costs associated with redundancy.

One way to proxy changes in firing costs is to look at changes in the OECD's employment protection legislation (EPL) index, which covers a wide array of labour market institutions including dismissal costs.(2) Stronger EPL is likely to mean businesses are less likely to reduce headcount during recessions. But the OECD index suggests little change in EPL since the mid-1980s. So, at first glance, it appears unlikely that higher firing costs have significantly affected the response of the labour market in this recession.

It is possible, however, that changes in the enforcement of employment protection legislation, which are not captured by the EPL index, affect labour market flows even in the absence of legal reforms (Fraisse, Kramarz and Prost (2009)). So even if the degree of EPL has remained unchanged, stronger enforcement may have increased the expected costs of dismissal.

The costs of hiring might also have increased over time, following rises in screening and training costs. That may have occurred, for example, if a higher proportion of jobs require specialist skills or training. Since the early 1990s, the fraction of UK working-age employees with at least a degree or higher education has increased from around 20% to around a third. To the extent that recruiting skilled employees is more costly than recruiting unskilled employees, search costs are likely to have increased. Furthermore, if employers have found it difficult to find skilled staff in the past, they may have wanted to hold on to them, despite falls in demand. Some contacts of the Bank's Agents have reported that they suffered skill shortages after they reduced the level of employment during periods of weak demand in the past.

An increase in hiring or dismissal costs may therefore account for some of the apparent flexibility of real wages relative to employment in the recent recession. But these factors are unlikely to explain all the difference in the behaviour of employment, relative to the 1990s.

Unionisation and collective agreements

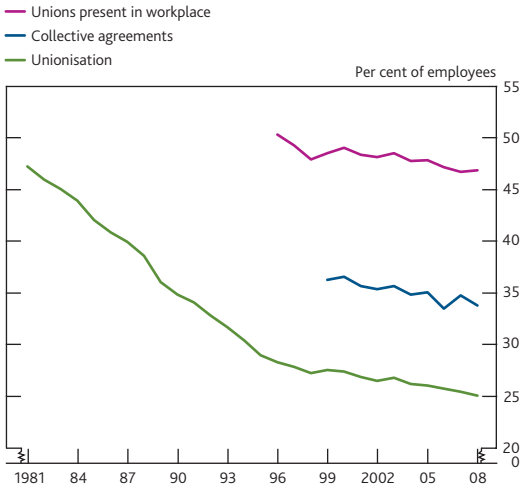
Another factor that may have contributed to the relative flexibility seen in real wages, and subsequently smaller falls in employment, is changes in the degree of unionisation and collective agreements. For example, Gnocchi and Pappa (2009) find that the volatility of real wages falls, and the volatility of unemployment rises, as the number of workers covered by collective agreements increases. In that case, a fall in the degree of unionisation since the 1990s may be able to account for some of the differences in employment and wages compared to the previous recession. As shown in **Chart 6**, there has been a small fall in unionisation rates since the

(1) The results in **Table B** are robust to the exclusion of the recessionary period from the sample. However, any analysis on filtered data will be sensitive to the specification of the time period and the choice of the filter. Using a different filter and different start, end and cut-off points for the great stability, Young (2008) finds that the relative volatility of employment was largely unchanged in the two subsamples.

(2) Dismissal costs include both severance and administrative costs. The index also covers legislation on advance notice, collective dismissals, unfair dismissals and temporary contracts.

1990s recession. And that may help explain some of the difference in the labour market response. But most of the decline in unionisation occurred during the late 1980s and early 1990s. As a result, it is unlikely that this can account for all the difference in the behaviour of the labour market in the recent recession, compared with the early 1990s.

Chart 6 Unionisation and collective agreements



Source: Department for Business, Innovation and Skills.

Businesses' expectations

Businesses' expectations about the pace of recovery may also have influenced their employment decisions. For example, businesses may have expected the weakness in demand to be less persistent than in the 1990s recession. In that case, they may have been more willing to retain employees in anticipation of a recovery in demand. But surveys of output expectations do not suggest that businesses expected this recession to be shorter than previous episodes of economic contraction.

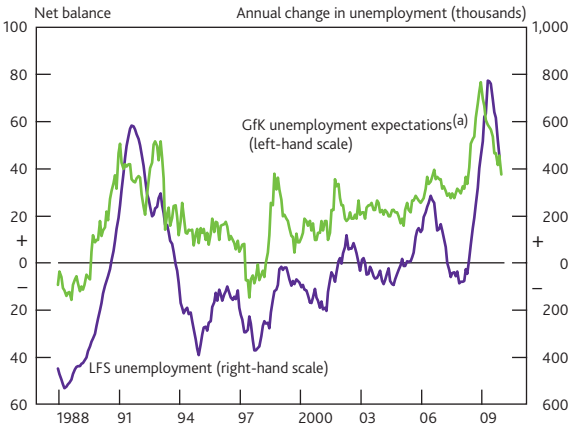
Employees' expectations

Changes in employees' expectations may also have contributed to the relative flexibility in real wages in the recent recession. For example, households may have been more concerned about the prospect of losing their job than in the past, persuading employees to trade lower real wages for job security. According to the GfK survey, the net balance of households expecting unemployment to rise increased sharply in late 2008 (**Chart 7**), eventually reaching its highest level since the question was first asked in 1988. More recently, the balance has fallen back and the increases in actual unemployment have also moderated.

Alternative combination of shocks to the 1990s

Structural changes in the labour market, and changes in businesses' and employees' responses during the recession, are likely to have played some role in reducing real wages and

Chart 7 Unemployment and a survey measure of unemployment expectations



Sources: Research carried out by GfK NOP on behalf of the European Commission and ONS (including the Labour Force Survey).

(a) The question asks how households expect unemployment to change over the next twelve months.

sustaining employment. But other concurrent factors are likely to have played a role as well. First, this section considers whether there has been an increase in labour supply, perhaps reflecting the sharp fall in financial wealth during the financial crisis. Second, it examines the response of businesses to the increase in import and export prices associated with sterling's depreciation. It then looks at the role of forbearance on the part of creditors reducing the number of business closures.

The resilience of employment may also indicate that output has fallen by somewhat less than currently indicated by official data. But based on average revisions over the past, and information from surveys, the scale of revisions are unlikely to be sufficient to account for the different behaviour of the labour market.(1)

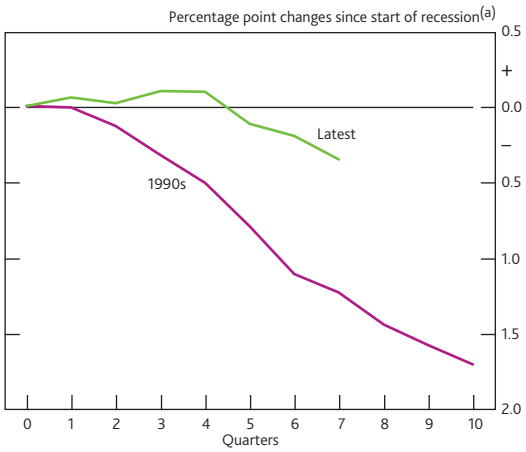
Labour supply

Real wages and employment are affected by developments in labour supply as well as labour demand. A higher supply of labour will tend to put downward pressure on wages, and so help to support employment. One measure of labour supplied is the participation rate — the proportion of adults who are either in work or actively seeking work — which has fallen back only slightly since the start of the recent recession, compared with a sharp fall in the early 1990s recession (**Chart 8**).

One factor that has helped to support the participation rate is the continuing rise in participation among older people. That may in part reflect increasing concerns about pension provision following the falls in financial wealth during the crisis period. Despite some gain in equity prices since their trough in March 2009, net financial wealth was 10% lower, as a proportion of household post-tax income, in 2009 Q3 than in

(1) See Section 3.1 of the February 2010 *Inflation Report* for a discussion of possible revisions to output estimates.

Chart 8 Participation rate



Source: ONS (including the Labour Force Survey).

(a) Measured as the change in the aggregate participation rate from the quarter before the start of the recession, where a recession is defined as in **Table A**.

early 2007. For those with defined contribution pension plans — a greater proportion than in the early 1990s — the reduction in retirement funds may have encouraged them to defer retirement in order to build up their pension income.

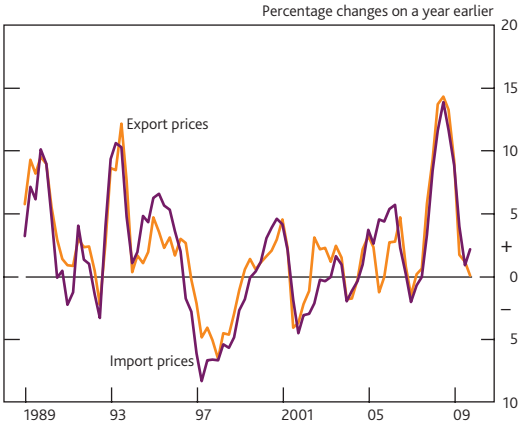
Households may also be choosing to work longer to compensate for downward revisions to their expected future income. As discussed in recent *Inflation Reports*, output is likely to remain substantially below the level it would have reached had it continued along its pre-recession trend. In large part that reflects the impact of the downturn on the supply capacity of the economy. Consequently, households may have revised down their income expectations. In addition, households may have anticipated any tax rises associated with the expected fiscal consolidation, leading them to further lower their income expectations.

Exchange rate depreciation

Businesses' wage and employment decisions during the recent recession are also likely to have been affected by the sharp fall in the exchange rate. The sterling effective exchange rate depreciated by 25% between mid-2007 and early 2009. In contrast, it remained relatively stable prior to and during the 1990s recession, only falling back in late 1992 following sterling's exit from the Exchange Rate Mechanism. The effect of sterling's depreciation on a particular business will depend on whether that business is exposed to the higher import costs that result, or whether they are able to benefit from increased competitiveness in overseas markets.

For a business that is more exposed to higher import costs (**Chart 9**), the fall in the exchange rate is another factor bearing down on their profit margins during the recession. The business could respond either by reducing nominal wage growth, by raising prices or by reducing employment. Given the weakness in demand, businesses may find it harder to pass the higher costs through to higher prices and that might increase the likelihood of businesses pushing down on wage growth or employment.(1) So higher import costs could help to explain some of the weakness in employees' real wages.

Chart 9 Sterling export and import prices



For exporters though, there are contrasting effects. To the extent that falls in the exchange rate result in higher sterling export prices, and so higher profit margins for UK exporters, businesses may use these to offset weak profits from their domestic business. And this could have helped to support employment. Over time, however, businesses may pass some of those higher margins through to higher nominal wages. Or they may try to increase their market share by reducing their sterling export prices, in which case they may need to hire more people to meet any consequent rise in demand.

The overall impact of sterling's depreciation on the labour market is therefore difficult to judge. The impact will depend in part on the extent to which importers have been able to offset higher import costs through lower real wages or whether they have had to cut employment levels. But it will also depend on the extent to which sterling's depreciation has led to higher profit margins for exporters. So far at least, much of the depreciation appears to have resulted in higher sterling export prices (**Chart 9**).(2) So while sterling's depreciation places additional pressure on the importing sector to reduce labour costs, it may have mitigated the need for job losses in the exporting sector.

Fewer business failures

Another feature of this recession is the smaller pickup in the proportion of businesses entering liquidation, and so the number of people facing forced redundancies as a result. This may reflect in part the increase in real wage flexibility. The smaller pickup in the liquidation rate may also be a result of forbearance on the part of the banks and tax authorities. An increase in creditor leniency may therefore have led to fewer

(1) Higher import prices squeeze businesses' profit margins in a similar way to higher energy prices. For a detailed discussion of how higher energy prices impact on the labour market, see Barwell, Thomas and Turnbull (2007).
(2) See MacCoille, Mayhew and Turnbull (2009) for a discussion of movements in export and import prices and the stability in the terms of trade.

forced redundancies through liquidations. And to the extent that the increased forbearance may only be temporary, it may imply further redundancies if the economy does not grow sufficiently quickly.

Risks

Employment intentions survey balances have recovered over 2009, and most contacts of the Bank's Agents have reported that they expected headcount to remain broadly stable over the coming months. But the labour market is continuing to adjust and it is possible that the picture may change over time as businesses seek to contain their labour costs.

The nature of the adjustment has important implications for the future path of the economy. For example, further job losses may lead households to increase their precautionary saving to insure against loss of work. That will mean households have less money available to spend on goods and services. And if some people suffer an extended period of unemployment, they may be unable to retain or acquire the skills sought by employers, limiting the recovery in output.

There remains considerable uncertainty about how the labour market will evolve. Demand may rebound more strongly than businesses have expected. And once businesses work off spare capacity, in order to satisfy that increased demand, employment might be expected to increase. But there remains a risk of further falls in employment if, for example, the recovery in demand proves more sluggish than businesses have expected. Businesses may respond to any future squeeze in profits by shedding staff. In addition, the outlook for employment depends on the extent to which creditors continue to show forbearance to businesses in financial difficulties. If more businesses are forced to enter liquidation, then there will be more forced redundancies and a fall in employment. And to the extent that the prospective fiscal consolidation is accompanied by reductions in public sector employment, rather than weaker real wages, that could provide a further downside risk.

The outlook for employment will also depend on developments in real take-home pay. Employees may have become more confident about the employment outlook and may be unwilling to accept a further squeeze in real wage growth. That could lead them to push for higher pay settlements this year. But if companies cannot afford the increase, then they may shed labour in order to contain labour costs.

Conclusion

This article has examined businesses' response to the recent recession, in terms of reducing labour costs, compared with previous recessions. To date, the larger fall in output has been associated with a smaller fall in employment, and weaker real wages, compared with the 1990s recession. In part, the unusual behaviour of the labour market is likely to reflect an increase in the flexibility of real wages relative to employment. But other shocks, such as the response of labour supply and the exchange rate depreciation, are likely to have played a role.

The adjustment in the labour market is, however, ongoing. Contacts of the Bank's Agents have reported that they expected headcount to remain broadly stable over the coming months. But the picture may change over time and there remains considerable uncertainty about how the labour market will evolve.

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Household debt, house prices and consumption in the United Kingdom: a quantitative theoretical analysis

Summary of Working Paper no. 379 Matt Waldron and Fabrizio Zampolli

Between 1987 and 2006 household debt and residential house prices in the United Kingdom increased substantially. During this period total household debt and house prices as a percentage of income both grew by more than 50%. These phenomena were accompanied by some large changes to the macroeconomic environment faced by UK households, which may have been seen as potentially long-lasting. In particular, the inflation rate fell to a low and stable level; long-run real interest rates fell both in the United Kingdom and internationally; and the population became older with the ageing of the baby-boom generation. Lower inflation eliminates the so-called front-end loading of mortgage repayments which means that, for a given initial level of repayments, consumers can borrow more as a fraction of their income than when inflation and nominal interest rates are higher. A lower long-run real interest rate lowers the current and future expected cost of housing as well as the cost of borrowing, all else equal. These two changes, together with the passing of the baby-boom generation through middle age, are likely to have boosted the demand for housing and other assets, and therefore to have been important determinants of the observed rise in house prices and debt over that period. However, it is not clear, *a priori*, how quantitatively important these changes were in terms of their ability to explain the increases in house prices and debt, or how they would have continued to affect the household sector balance sheet and the housing market in the subsequent years or decades. Moreover, while there did not appear to be a large amount of uncertainty about the inflation target and the future inflation rate, there was considerable uncertainty about the persistence of the low level of the real interest rate.

In this paper we set out to investigate these issues. Specifically, we are interested in understanding to what extent changes in demographics, lower inflation, and the lower real interest rate can explain the observed rise in UK house prices and debt over the two decades after 1987. It should of course be clear that, although these are all matters of great interest to policymakers, the long-run real interest rate is a structural aspect of the real economy which is unaffected by monetary policy. We are also interested in how these factors might affect the long-run equilibrium of the economy, and how the economy might adjust to that equilibrium. However, we do not attempt to explain the behaviour of house prices and consumption in the extreme conditions faced by households in 2008 and 2009.

The workhorse of our analysis is an 'overlapping generations' model calibrated to the UK economy. It recognises that households do not live forever, and that at any one time there are households in different parts of their lives — some young, some middle aged and some retired. The model incorporates: housing and non-durable consumption; financial wealth; loan to value and loan to income borrowing constraints; realistic demographics; and bequests. The results suggest that demographic factors can be important in explaining the evolution of the household sector's aggregate balance sheet, but are not alone capable of producing the size of the movements in debt and house prices that we have observed in the data. Moreover, the effects of demographic change are too gradual to account for the sharp rises in debt and house prices that occurred during the second half of that period. What instead emerges from our analysis is that the main driver of the rise in house prices and debt is the decline in the real interest rate, most of which occurred after the turn of the century, and which was an international phenomenon. Crucial to that conclusion is the assumption that households perceived low global real interest rates as being permanent. In that case, the model can explain the rise in debt and much of the rise in house prices.

However, it should be noted that the extent to which the model can quantitatively explain the rise in house prices depends in large part on the period of comparison. For example, the model can more than explain the rise in UK house prices between 1992–96 and 2002–06, but not between 1997–2001 and 2002–06. In addition, comparisons are further complicated by the division of model time periods into five-year chunks (which helps to ensure that the computational demands of our exercises are not excessive). The model only more than explains the rise in house prices between 1992–96 and 2002–06 if the level of house prices in 2002–06 is taken to be the average prevailing over that period. If instead, the level of house prices in 2002–06 is taken to be that prevailing in 2006, the model cannot explain all of the rise in UK house prices over that period. All of that suggests that care should be taken not to draw precise quantitative conclusions from our analysis. Nevertheless, and consistent with standard economic theory, one implication of our results is that the level of long-term real interest rates is a crucial factor in determining the equilibrium level of debt and house prices.

A by-product of a fall in the real interest rate is strong consumption and a corresponding decline in financial wealth. So, we are unable to explain some features of the data. That is, that the increase in house prices was not accompanied by a consumption boom, but was instead accompanied by an accumulation of both financial assets and financial liabilities. This failing, together with the abstract nature of our model and its reliance on assumptions about unobservable parameters, means that there is some uncertainty around the conclusion that the rise in debt and house prices observed at the end of 2006 was to be expected.

Evaluating and estimating a DSGE model for the United Kingdom

Summary of Working Paper no. 380 Richard Harrison and Özlem Oomen

It is impossible to conduct monetary policy without some understanding of how the economy works, and consequently economic models are vital in this process. The Bank of England uses many such models, some very abstract and others largely data driven. In this paper, we examine one that is both rich in theory and consistent with the data. We estimate it using UK macroeconomic data from 1955–2007.

Our approach has two stages. First, we derive predictions about the relationships between key economic variables in both the short run and long run, using judgement to select sensible values for the parameters so that we can deliver specific results. We then compare these with the actual behaviour of UK data. This comparison helps us to identify those relationships that fail to match data closely and hence where additional features may be required. In the second step, we incorporate these features, called 'structural shocks', and estimate the parameters that best fit the data. The shocks that we add are in the form of movements in the demand and supply curves that determine prices and quantities. We find that they are crucial in helping the model match reality.

We work with four key sectors: households, businesses, the monetary policy maker and the rest of the world. Households receive income from working and interest from past saving. They choose how much of their total income to spend on goods and services and how much of it to save, depending on the real rate of interest earned on saving. A higher real interest rate will, other things equal, encourage households to save more. Businesses produce the goods and services that households buy. They set the prices for their products and decide how much labour and capital to employ in order to maximise their profits. Importantly, businesses face costs of adjusting their prices which means that they find it best to change them gradually. The monetary policy maker sets the nominal interest rate by adjusting it in response to changes in inflation and output. The rest of the world, modelled using a set of estimated equations, affects the domestic economy through the demand for the goods and services that it produces.

Together, these features allow us to describe how households, businesses, the monetary policy maker and the rest of the world interact. The values of the parameters are an important determinant of the consequent behaviour of macroeconomic variables. For example, there is a parameter that determines the willingness of households to substitute consumption spending today for consumption spending in the future. If households are less willing to substitute consumption today for future consumption, then their saving and consumption decisions will be less affected by changes in the real interest rate. Similarly, there are parameters that determine the costliness to businesses of changing prices (an example of a 'friction'). Other things equal, if prices are more costly to adjust, a business prefers to adjust the amount of labour and capital it employs in response to a change in the demand for its products, rather than changing the price that it charges. To evaluate the model, we use data on consumption, gross domestic product, investment, total hours worked, real wages, the nominal interest rate and inflation. We choose the longest available data set in order to gain as much information as possible about the parameters, while recognising that there will be a trade-off against accuracy if, as is likely, their values change over time.

When we compare the model's predictions about the relationships between key variables to the behaviour of UK data, we find some important differences. In many cases, the model predicts a much stronger relationship between variables in the short run than we observe in the data. And it predicts a weaker long-run correlation between the movements in consumption and output. It also predicts that real wages are less variable than we observe in the data.

So before we estimate the parameters, we incorporate additional shocks in the form of random movements in the demand and supply curves. For example, we assume that a household's preferences for spending versus saving may vary somewhat over time. This means that, in some periods, households will be inclined to save less, even when the real interest rate is high (and *vice versa*). When we estimate the model, we find that these structural shocks are very important in helping it to better match the behaviour of the data. Our estimation results also suggest that the parameters that determine the costliness of adjusting prices are more in line with similar work using US data, rather than in studies using data from the euro area. But we do not have the whole story. For example, the estimated model does not explain nominal interest rates well. Ways to explore this could include extending the approach to allow for the fact that monetary policy may change over time.

All together now: do international factors explain relative price comovements?

Summary of Working Paper no. 381 Özer Karagedikli, Haroon Mumtaz and Misa Tanaka

Recent research has found that a common component explains a greater proportion of quarterly inflation movements in industrialised countries after the mid-1980s relative to the period before that. There are two possible explanations for this finding. First, the increased comovement in inflation rates could reflect adoption of similar monetary policy across the industrialised countries. For example, it has been argued that the central banks of Japan, Germany and the United States have pursued an implicit form of inflation targeting since the beginning of the 1980s; and during the 1990s, inflation targeting has been explicitly adopted in a number of industrialised countries. Second, it could reflect the increased integration of global product and factor markets, which subjects the relative prices of similar products in different countries to common demand and cost shocks. Although the overall inflation rate in an economy is ultimately determined by domestic monetary policy, fluctuations in relative prices can affect headline inflation rates in the short run.

This paper examines the extent to which the increased comovement in inflation rates across countries can be attributed to greater global integration of product markets by using a statistical approach to decompose fluctuations in quarterly inflation rates into a world factor, country-specific factors, and category-specific factors. The world factor captures the common pattern in inflation rates across all product categories across all countries. Country-specific factors capture the common pattern in inflation rates across all product categories within the same country. Finally, the category-specific factors capture the common pattern in inflation rates across countries for the same product categories (eg clothing).

The point of this exercise is that the international common component found in previous research may not necessarily be the one that affects every single sector or products in different economies. It may also be product specific. For example, the international factors affecting rice prices across countries may be different from international factors affecting car prices. Therefore, analysis that ignores these good-specific factors may underestimate the true nature and the size of the contribution of international factors in explaining cross-country comovements in national inflation rates. Our approach allows us to explore this issue further. If it is indeed the adoption of similar monetary policy rather than global integration of product markets that is driving the international comovement in inflation rates, then we should not find any evidence for comovement in product category inflation rates. By contrast, if the international comovement in inflation rates is driven by integration of global markets, which subjects prices of similar products to global cost and demand shocks, we would expect to see cross-country comovement in product category inflation rates.

We find that product category factors explain a significant proportion of fluctuations in quarterly inflation rates for products that are intensive in primary commodities; but this is less evident for other traded goods. We also find that both the world factor and product category factors have become more significant in explaining the fluctuations in quarterly inflation rates for most product categories. Finally, the sharp pickup in inflation rates during 2007–08 was captured by our estimated world factor, but in some countries the rise in the inflation rate also reflected country-specific factors.

Time-varying dynamics of the real exchange rate. A structural VAR analysis

Summary of Working Paper no. 382 Haroon Mumtaz and Laura Sunder-Plassmann

Recent empirical studies have provided strong evidence to suggest that the persistence and volatility of macroeconomic variables has evolved over time in industrialised countries. In particular, this literature (albeit conducted on data prior to the onset of the financial crisis and consequent recession) shows that inflation was less volatile and persistent in recent years than in the 1970s. Moreover, measures of real economic activity were also less volatile. A strand of this literature also suggests that the transmission of shocks to the macroeconomy may have changed over time. One limiting feature of these studies, however, is the absence of any role for the real exchange rate in the models used. Instead, exchange rate dynamics have been investigated in an alternative strand of research using empirical models that do not allow for changes in the transmission of shocks. This is surprising given the weight of evidence that indicates a change in the dynamics of macroeconomic fundamentals such as output and inflation.

The aim of this paper is to reconcile these two empirical strands of the literature. We estimate a system of equations (a vector autoregression) to capture the relationship between the real exchange rate and output and inflation for four industrialised economies — the United Kingdom, Japan, euro area and Canada *vis-à-vis* the United States. Our model allows this dynamic relationship to change over time. In addition it allows the volatility of shocks hitting these economies to change over time.

Our results are as follows. The effect of demand shocks on the real exchange rate has increased over our sample for the United Kingdom, euro area and Canada, with the current response (using data to 2008 Q4) larger than in the 1970s and the early 1980s. Similarly, nominal shocks (defined as an appreciation of the real exchange rate that leads to a fall in output and inflation) have a larger impact on the real exchange rate after the mid-1980s. A model that keeps the relationship between the real exchange rate and the macroeconomy fixed is unable to capture these changes in real exchange rate dynamics. There is also evidence that the relative importance of these shocks has changed over time. Nominal shocks are important for inflation in the late 1980s but less so in the more recent period. Supply shocks appear to have a limited role in explaining real exchange rate fluctuations. For Canada and Japan demand shocks have become a more important source of output fluctuations over the past ten years. Demand shocks have been the most important factor for the real exchange rate for all countries and throughout the sample, accounting for around 80% of exchange rate fluctuations on average.

Report

Monetary Policy Roundtable

Introduction

On 15 December, the Bank of England and the Centre for Economic Policy Research hosted the third Monetary Policy Roundtable. These events are intended to provide a forum for economists to discuss key issues affecting the design and operation of monetary policy in the United Kingdom.(1) As always, participants included a range of economists from private sector financial institutions, academia and public sector bodies. At this third Roundtable there were two discussion topics:

- monetary policy and the current conjuncture; and
- the recession and the UK labour market.

This note summarises the main points made by participants. Since the Roundtable was conducted under the 'Chatham House Rule', none of the opinions expressed at the meeting are attributed to individuals. The views expressed in this summary do not represent the views of the Bank of England, the Monetary Policy Committee (MPC) or the Centre for Economic Policy Research.

Monetary policy and the current conjuncture

Views about short-term economic prospects were generally downbeat. Although the cuts in Bank Rate since October 2008 had led to considerable reductions in households' debt interest payments, consumer spending had remained subdued as households increased saving and began to repair their balance sheets. Household spending was likely to remain weak in the near term, but there were different views about the likely persistence of this weakness. Some believed that the recession would lead to a protracted period during which consumers would be averse to borrowing and would seek to reduce their leverage. Participants pointed to previous episodes of significant balance sheet restructuring — in the United Kingdom, Japan, Sweden and Thailand — which had lasted around six to eight years, although the unprecedented nature of the current recession limited the insights from these historical comparisons.

Others, however, thought that a persistent change in consumer attitudes to debt was less likely. Little of the rise in household savings had been used to repay debt or accumulate financial assets. Instead, most of the savings had been channelled into a further accumulation of housing assets. That was corroborated by the recent rally in house prices, which had recovered much more quickly than in the 1990s recession. Consequently, a recovery in the supply of mortgage credit would likely lead to a reduction in the savings rate, and hence slow the deleveraging process. That, however, would also take time — the banking system remained significantly impaired, and although banks had begun to repair their balance sheets, significant further adjustment was required. Banks' strategies for raising capital and liquidity ratios and reducing leverage multiples were likely to inhibit a rapid recovery in bank lending. As a result, tight credit conditions were likely to remain a feature of the economic landscape for some time. Participants noted that many macroeconomic models did not account for the role of balance sheets and frictions in credit markets. As a result, such models have only been able to provide limited insight into the economic impact of recent developments in credit conditions.

Investment was also likely to remain subdued. In part, that reflected the wide margin of spare capacity in the economy. But it also reflected the expected tightness of credit conditions. Although lenders had reported improvements in corporate credit availability during the second half of 2009, surveys of borrowers suggested that many companies, particularly small and medium-sized businesses with limited or no access to capital markets, had continued to find credit conditions highly restrictive. In addition, businesses' desire to reduce leverage further (following record levels of bank debt repayment), was likely to restrict investment.

Inventory levels had been cut back aggressively over the past year. A reduction in the pace of de-stocking would boost GDP growth in the coming quarters. But participants were sceptical of any substantial increase in stock levels going forward. The stock-output ratio was close to its average of the past fifteen years; and some surveys suggested that the current level of inventories was already deemed sufficient to meet expected demand. Moreover, tight credit conditions and the desire to preserve buffers of working capital may encourage businesses to hold lower levels of stocks than in the past. Those businesses which needed to increase stocks to provide for a recovery in demand may find it difficult to raise the necessary finance.

(1) Roundtables are held twice a year: a full-day event in the first half of the year and a half-day event in the second half of the year. The next Roundtables are scheduled for July and December 2010.

Participants noted that the fiscal plans outlined in the *Pre-Budget Report 2009* (*PBR*) contained little news about the timing, composition and extent of any further consolidation in the public finances. Many thought that the *PBR* projection of a sharp rise in public sector debt relative to nominal GDP would leave little headroom for any further fiscal expansion. Other countries, which had also experienced deteriorations in their public finances, faced similar challenges.

In the past, net trade had played an important role in the early phases of economic recovery. Participants discussed whether the same would be true this time. It was thought that the significant exchange rate depreciation since the summer of 2007 should boost exports and reduce imports in the coming quarters. But some participants were cautious about a strong recovery in net trade. Tight credit conditions continued to restrict activity in the export sector. Some exporters whose prices are fixed in local currency terms (ie in terms of the currency of the foreign destination) had used the exchange rate depreciation to boost their margins. And some surveys suggested that perceived export competitiveness had not risen by as much as the exchange rate depreciation may have implied.

Monetary policy had been loosened significantly over the past year. Bank Rate had been reduced to 0.5%, and maintained at that level for most of the year. And in March 2009, the MPC had embarked upon a programme of asset purchases financed by the issuance of central bank reserves. At its November meeting, the Committee had voted to extend that programme by £25 billion, to a total of £200 billion.

Some participants questioned the efficacy of the Bank's asset purchases. The introduction of quantitative easing in Japan had not generated a rise in bank lending. And some believed that the Bank's asset purchase programme would have only a limited impact on an economy with few willing lenders and weak private sector demand for credit. As a result, those participants advocated alternative policies, aimed at providing credit more directly to the corporate sector.

Others argued that the MPC's asset purchases were having a demonstrable impact on the economy. Corporate bond yields had fallen and stock markets had rallied markedly since March. These developments had both reduced the cost of corporate debt and equity issuance, which had risen to record levels. These improvements in debt markets had enabled businesses to repay bank loans, which in turn would help banks rebuild their balance sheets. But some participants were concerned that policy had served to reinflate asset prices and spending, and hence hinder the necessary adjustment in private sector balance sheets.

CPI inflation was likely to rise over the coming months, reflecting the reversal of the December 2008 cut in VAT and (for some) the continued impact of the past depreciation of sterling. Thereafter CPI inflation was likely to fall back sharply, and remain subdued in the medium term. Some participants attributed this underlying weakness in inflation to the significant margin of spare capacity that had emerged during the recession, which would bear down on prices going forward. Others, who had questioned the impact of the output gap on prices, attributed the expected weakness of inflation to a prolonged period of balance sheet adjustment and the associated weakness in money and credit growth.

The recession and the UK labour market

The second discussion topic at the Roundtable centred on the response of the UK labour market to the recent recession. The labour share of income (which accounts for changes in both earnings and the number of people employed) had risen in line with the experiences of the 1980s and 1990s recessions. But compared to these past recessions, the current episode had a number of important differences: output had fallen by significantly more; employment had fallen by significantly less; and wage growth had moderated markedly. Roundtable participants discussed a number of possible explanations. Some attributed the limited response of employment to an increase in wage flexibility — wage growth had moderated markedly over the past year, enabling businesses to hoard more labour than in previous recessions. But others thought that the labour share of income would need to fall back substantially. And the relationship between vacancies and unemployment, another proxy for changes in labour market flexibility, had remained little changed since the previous recession.

Others thought that the disparity between the falls in output and employment, and the precipitous decline in labour productivity they implied, suggested that either the decline in output had been overestimated, or the fall in employment underrecorded. But there was a lot of evidence against this view. Output had fallen sharply all over the world: the fall in other countries' output was corroborating evidence that output had fallen sharply in the United Kingdom too. As for employment, the data may not properly capture migrants who have lost their jobs and returned home. But these were likely to be concentrated in certain sectors such as construction, and falls in employment had been broad-based across all sectors.

The limited response of employment in the United Kingdom stood in stark contrast to the marked rise in unemployment in the United States. Participants noted that comparing the behaviour of these two labour markets may help to shed light on the unusual behaviour of the UK labour market. Some attributed the pronounced rise in US unemployment to the fact that wage growth outstripped that of labour productivity prior to the recession. Earnings should grow in line with productivity in the medium term, so some combination of

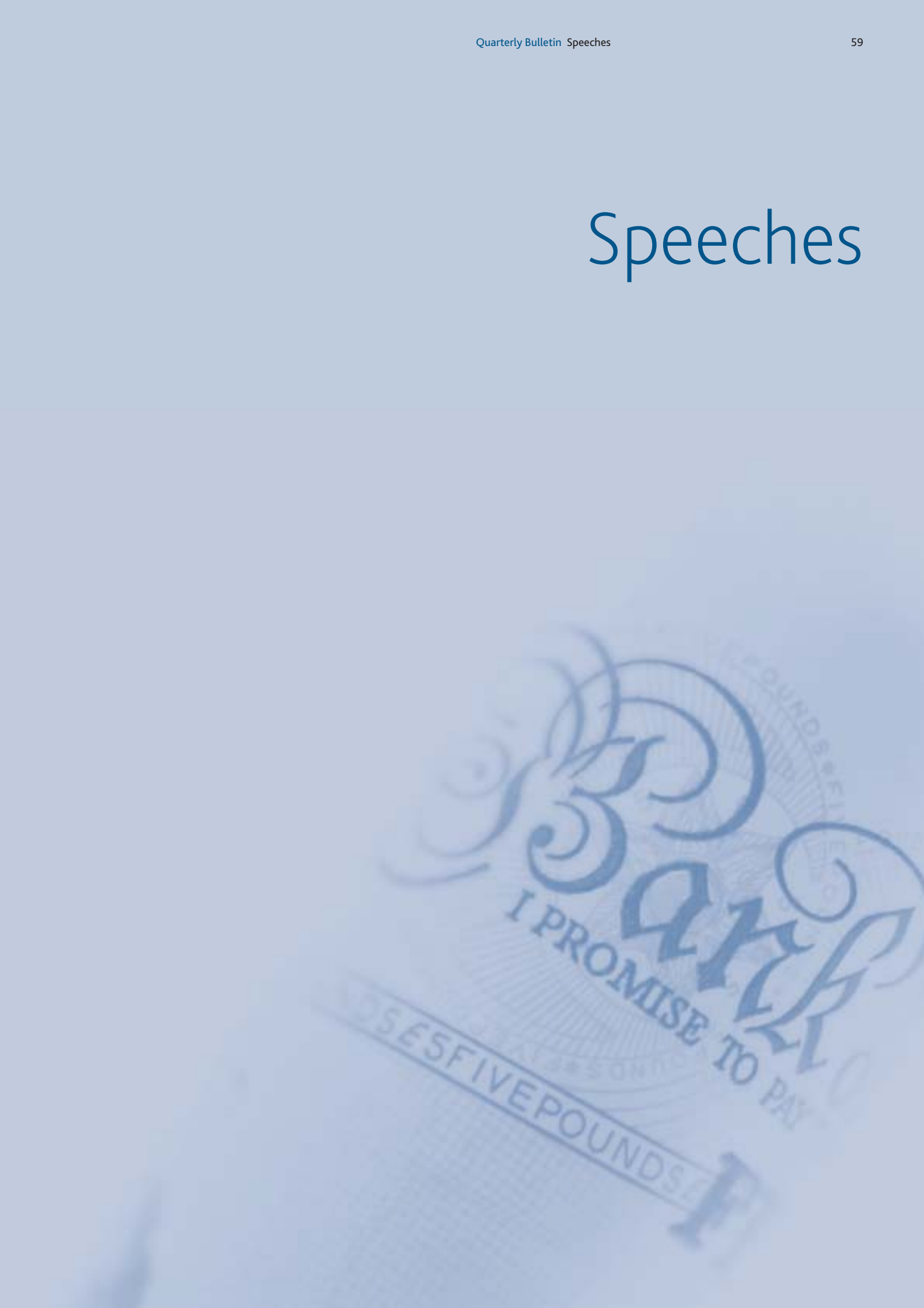
weaker earnings growth or higher productivity growth was required. The significant reductions in US employment may have been part of this adjustment.

It was noted that some of the rise in US unemployment may also reflect a growing degree of 'mismatch' in the labour market, with employers finding it increasingly difficult to recruit appropriately skilled staff to fill their vacancies. The number of vacancies in the United States had remained little changed of late despite increases in unemployment, which was consistent with an increase in mismatch.

Participants thought the outlook for the UK labour market to be highly uncertain. The muted rise in unemployment may in part reflect lags in the labour market. Some businesses may have chosen to hoard labour in the expectation of an economic recovery, which, if proved unfounded, could lead to a further rise in unemployment. And although pay prospects remained muted, wage growth had exceeded productivity growth in Q2, suggesting that some further moderation in earnings growth may be required to prevent additional cuts in employment. The upcoming round of wage negotiations and the degree of restraint employees exerted in their wage demands would have a material influence on the outlook for employment. Finally, the planned fiscal consolidation may entail some reduction in public sector employment, which had continued to increase in recent quarters. This would put upward pressure on unemployment.

On balance, participants expected unemployment to peak lower than in previous recessions. But many expected hiring to remain subdued and that unemployment would stay high for longer than in previous similar episodes, with businesses choosing to work their employees more intensively, rather than recruiting new staff.

Speeches



Bank of England speeches

A short summary of speeches made by Bank personnel since publication of the previous *Bulletin* are listed below.

Interpreting monetary policy

David Miles, Monetary Policy Committee member, February 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech425.pdf

In this speech, David Miles discussed quantitative easing (QE). Asset purchases triggered a process of portfolio rebalancing as newly injected money was passed from investor to investor. The channels through which the money might flow were helpful in alleviating problems in the banking sector. The most important channels were difficult to identify, but most were helpful, and none were obviously harmful. QE could have relatively rapid effects on asset prices and credit conditions, and then with a lag on activity and spending, even if the impact on broad money aggregates was less evident.

Financial market conditions prior to the QE policy had been poor. Interbank lending and corporate borrowing costs were high and asset prices had fallen sharply. Since QE began Libor-OIS and corporate bond spreads had declined, asset prices had recovered, and gross corporate bond and equity issuance had been unusually strong. Broad money growth had been weak, but might have been even weaker in the absence of the QE policy. And QE had positive effects, by helping companies to pay down bank debt, or banks to issue equity, which had little impact on broad money.

The size of many central bank balance sheets had expanded as policies, with many similarities to QE, had been implemented. So although financial market conditions had improved internationally, this did not mean QE had had little impact in the United Kingdom.

Holding the stock of asset purchases at their current level meant their impact on the UK economy would be allowed to continue. It was plausible that an even more expansionary monetary policy might be required. If so, the stock of asset purchases would be added to, and at some point reduced, depending on economic events. In formulating monetary policy it was important to consider not only the most likely path of inflation but also the risks and uncertainties. For this reason the Monetary Policy Committee was ready to change monetary policy in either direction.

Inflation, growth and stability: balancing the Bank of England's economic priorities

Paul Tucker, Deputy Governor, February 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech424.pdf

In this speech, Paul Tucker discussed some of the current challenges facing monetary policy and issues relevant to the overall framework for preserving macroeconomic stability.

He highlighted four aspects of the current conjuncture that will be central to monetary policy judgements over the coming months. First, the effects of household and bank balance sheet repair on aggregate demand, which pose a downside risk to the outlook for activity. Second, that the economy's supply capacity is likely to depend on the strength of the recovery. A weak recovery would probably lead to a reduction in capacity, whereas a robust recovery would cause firms to bring back on line capacity that has been suspended so far. That makes it harder to gauge the outlook for inflation. Third, inflation will be above target in the short run due to external factors, posing a risk to inflation expectations. Fourth, the strength and lags in the effects of quantitative easing were uncertain, but it seemed likely that it was still to have its full effect on some asset prices, as well as on demand for goods and services. In contemplating its 'exit strategy' in due course, it would be important for the MPC to take into account how that would affect banking system financing conditions.

He then considered a number of issues for the policy framework for maintaining macroeconomic stability. Those include: the need permanently to embed renewed interest in financial markets, money and credit, so that we truly learn from that information in future. This would entail making sense of risk and liquidity premia. Second, it was clear that relying entirely on using monetary policy to 'mop up' after credit cycle excesses was a mistake by policymakers worldwide — the debate about macroprudential instruments was, therefore, very important. If effective macroprudential tools could be developed, it would be the most significant extension in the overall international macro policy framework in a generation. And finally, that given governments provide the final protection against economic collapse, debt levels as well as deficits matter. The higher the level of debt over coming decades, the more resilient the financial system would need to be.

The corporate sector and the Bank of England's asset purchases

Paul Fisher, Executive Director for Markets, February 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech423.pdf

In this speech, Paul Fisher outlined the rationale for the Bank of England's interventions in the corporate credit market, reviewed the schemes and evaluated the results so far. Importantly, he noted that the Bank's responsibilities do not give it a mandate to provide a source of long-term funding for the commercial banking system. And in that regard, he reiterated that the Special Liquidity Scheme will close at the end of January 2012. He described how a central bank may step in as a 'Market Maker of Last Resort' in order to maintain conditions for the stable provision of financial services. The corporate Asset Purchase Facility (APF) schemes, launched over the past year, should be seen in that light. The interventions appear to have contributed to improved liquidity in the sterling corporate bond and commercial paper markets. And by boosting the demand for risky assets, the APF gilt purchases have been complementary to the corporate schemes.

The debt hangover

Andrew Haldane, Executive Director for Financial Stability, January 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech422.pdf

In this speech, Andrew Haldane discussed the implications of the stocks of debt held by agents across the economy — the 'debt hangover'. This debt hangover is affecting households, financial and non-financial companies and sovereign states to varying degrees, but is perhaps greatest in the financial system. In terms of possible remedial actions, first, banks should take advantage of the profits they have achieved this year to bolster their balance sheets and, second, debt claims could be restructured into equity to benefit both lenders and borrowers, of which there have already been some examples. In order to moderate the frequency and scale of crises going forward, two policy reforms are proposed — macroprudential policies designed to curb the credit cycle and redesign of debt contracts such that they become state contingent.

Economic recovery, the housing market and inflation

Andrew Sentance, Monetary Policy Committee member, January 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech421.pdf

In this speech, Andrew Sentance argued that common influences had been driving developments in the UK economy and housing market. He suggested that the housing market recovery was more likely to resemble that of the 1980s than that of the 1990s, mainly because of a limited supply overhang. He also discussed the positive prospects for economic recovery more generally and cautioned that there were a number of uncertainties. Balance sheet adjustments in the financial sector and the need for public sector rebalancing were two particular areas of concern. Risks also remained around the inflation outlook. For example, as the world economic recovery gathered momentum, there was a danger it would put upward pressure on global energy and commodity prices. But the MPC stood ready to adapt its policies to the changing economic situation — just as it had through the recession.

Shadow banking, financing markets and financial stability

Paul Tucker, Deputy Governor, January 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech420.pdf

In this speech, Paul Tucker discussed one aspect of the financial sector 'structure' debate: the role of shadow banking. Shadow banking can be thought of as the collection of instruments, structures, firms or markets which, alone or in combination, and to a greater or lesser extent, replicate the core features of commercial banks: liquidity services, maturity mismatch and leverage. They are often considered a product of 'regulatory arbitrage' and can be problematic if the resulting non-bank forms of financial intermediation replicate the systemic risks posed by banking itself without being subject to equivalent oversight and safety nets.

He discussed a number of examples that developed prior to the recent financial crisis. Those include: money market mutual funds; finance companies; structured investment vehicles and asset-backed commercial paper; the prime brokerage services of securities dealers; the use of securities lending as a financing market; and the repo-financing of mortgage-backed securities.

With the 'regulation and structure' debate focused on how to make the core banking system safe and sound, he emphasised the need to think through what might comprise shadow banking and how the regulatory system should respond. In particular, it is important to think through how to avoid the

problems of the past few years replicating themselves beyond the perimeter of the regulated banking sector in the future. Where shadow banking provides an alternative home for liquid savings, offering *de facto* deposit and monetary services, he argued that the authorities should be ready to bring them into the banking world itself. In the latest episode, constant net asset value, instant-access money funds and the prime brokerage units of the dealers seem to have been examples of that.

Speech by the Governor

Mervyn King, Governor, January 2010.

www.bankofengland.co.uk/publications/speeches/2010/speech419.pdf

In this speech, the Governor focused on describing how the imbalances in the world economy over the past decade or so had contributed to the crisis. New entrants to the world trading system had followed an export-led development strategy — relying on running current account surpluses by providing huge quantities of manufactured goods at low prices. At the same time, countries importing these goods ran deficits and required low savings to maintain overall demand in their economies. Both sides seemed to gain from this arrangement — they were the benefits of trade.

But corresponding to the trade flows were enormous capital flows. Over time these cumulated into massive and unsustainable balance sheet positions. This provided the fuel which the developed world's inadequately designed and regulated financial system ignited to produce a firestorm that engulfed us all.

Dealing with these issues is not something a single country can do by itself. It is an issue of how countries interact. It is not a new issue — it was a problem debated at the Bretton Woods conference at the end of World War II. The problem is essentially political, rather than economic: are countries willing to ensure that their economic policy frameworks are consistent with each other?

The Governor highlighted that the G20's new policy co-ordination framework is a promising mechanism through which this problem can be tackled in the near term. In the longer term, this framework could be enhanced if more countries could be encompassed, giving it greater legitimacy. That might be achieved if the G20 were to metamorphose into a Governing Council for the IMF.

The Governor concluded the speech by highlighting that, as well as working with international partners, there were also important domestic policy actions that we should not neglect, in order to raise our national savings rate.

The future financial landscape

David Miles, Monetary Policy Committee member, December 2009.

www.bankofengland.co.uk/publications/speeches/2009/speech418.pdf

In this speech, David Miles discussed the outlook for the financial sector. The belief that banks had *de facto* state insurance, borne out by government interventions during the financial crisis, had led to falling capital levels and liquid assets holdings and lower bank funding costs. But regulatory responses to the financial crisis, such as stricter capital and liquidity requirements, would increase the cost of bank lending.

The impact of a smaller banking sector would depend on the substitutes to bank lending. For both non-financial companies and households bank debt accounted for around one fifth of their assets. Households were more dependent on bank debt for external finance but relied more on savings to finance asset accumulation.

Bank finance, through debt rather than equity, might be beneficial when informational asymmetries existed in assessing inherently risky investments. Banks could have some comparative advantage or exploit economies of scale in assessing these risks. However, the mispricing of assets and risk by the banking sector had demonstrated such benefits were likely to be limited. Rather, the growth of the banking sector had reflected a combination of tax factors (favouring debt over equity finance) and implicit subsidies from state insurance. And government interventions had demonstrated the costs of providing such insurance.

The mark-up between the central bank policy rate and the effective cost of funds could be affected by a smaller banking system. The level of Bank Rate consistent with a particular average rate of inflation might be lower. In the short run substitutes to bank lending would be limited. Quantitative easing (QE) smoothed the adjustment by making it easier for non-financial companies to issue equity and debt — as investors who had sold gilts to the Bank of England sought to replace them with close substitutes. Since QE began corporate bond spreads had fallen and equity prices increased.

Banknotes in circulation — still rising: what does this mean for the future of cash?

Andrew Bailey, Executive Director for Banking Services and Chief Cashier, December 2009.

www.bankofengland.co.uk/publications/speeches/2009/speech417.pdf

In a speech to the Banknote Conference 2009, Andrew Bailey considered explanations for recent trends in the demand for banknotes. He noted that sustained low inflation had increased confidence in the real value of the currency since the mid-1990s, while more recently the demand for banknotes, particularly £50 notes, had risen during the recession.

Turning to the challenges faced by the Bank in managing the circulation of its banknotes, he set out the importance of maintaining the physical quality of notes in circulation and of meeting the public's demand for different denominations and noted the ongoing difficulties in ensuring there were enough £5 notes in circulation. Bailey added that while there had been some increase in £5 notes in circulation over the past two years, there was still more to be done and noted that two recent pilot exercises with HSBC and Sainsbury's suggested that progress could be made.

Appendices

Contents of recent Quarterly Bulletins

The articles and speeches that have been published recently in the *Quarterly Bulletin* are listed below. Articles from May 1994 onwards are available on the Bank's website at:

www.bankofengland/publications/quarterlybulletin/index.htm.

Articles and speeches

Speeches are indicated by (S)

– UK monetary policy: good for business? (S)
– Consumption and interest rates (S)

2007 Q4
– Household debt and spending: results from the 2007 NMG Research survey
– The macroeconomic impact of higher energy prices on the UK economy
– Decomposing corporate bond spreads
– The foreign exchange and over-the-counter derivatives markets in the United Kingdom
– The Governor's speech in Northern Ireland (S)
– Current monetary policy issues (S)
– The global economy and UK inflation (S)
– Trends in European labour markets and preferences over unemployment and inflation (S)
– Fear, unemployment and migration (S)
– Risk, uncertainty and monetary policy (S)
– New markets and new demands: challenges for central banks in the wholesale market infrastructure (S)
– A tale of two shocks: global challenges for UK monetary policy (S)

2008 Q1
– Capital inflows into EMEs since the millennium: risks and the potential impact of a reversal
– Recent developments in portfolio insurance
– The Agents' scores: a review
– The impact of low-cost economies on UK import prices
– The Society of Business Economists' survey on MPC communications
– The Governor's speech in Bristol (S)
– The impact of the financial market disruption on the UK economy (S)
– The return of the credit cycle: old lessons in new markets (S)
– Money and credit: banking and the macroeconomy (S)
– Financial markets and household consumption (S)

2008 Q2
– Public attitudes to inflation and interest rates
– Recent advances in extracting policy-relevant information from market interest rates
– How do mark-ups vary with demand?
– On the sources of macroeconomic stability
– A review of the work of the London Foreign Exchange Joint Standing Committee in 2007
– Sovereign wealth funds and global imbalances (S)
– Monetary policy and the financial system (S)
– Inflation and the global economy (S)
– Does sterling still matter for monetary policy? (S)
– Strengthening regimes for controlling liquidity risk: some lessons from the recent turmoil (S)
– Inflation, expectations and monetary policy (S)

2008 Q3
– Market expectations of future Bank Rate
– Globalisation, import prices and inflation: how reliable are the 'tailwinds'?
– How has globalisation affected inflation dynamics in the United Kingdom?
– The economics of global output gap measures
– Banking and the Bank of England (S)
– The Governor's speech at the Mansion House (S)
– A tale of two cycles (S)
– The financial cycle and the UK economy (S)
– The credit crisis: lessons from a protracted 'peacetime' (S)
– Financial innovation: what have we learnt? (S)
– Global inflation: how big a threat? (S)
– Remarks on 'Making monetary policy by committee' (S)

2008 Q4
– The financial position of British households: evidence from the 2008 NMG Research survey
– Understanding dwellings investment
– Price-setting behaviour in the United Kingdom
– Monetary Policy Roundtable

2009 Q1
– Price-setting behaviour in the United Kingdom: a microdata approach
– Deflation

2009 Q2
– Quantitative easing
– Public attitudes to inflation and monetary policy
– The economics and estimation of negative equity
– A review of the work of the London Foreign Exchange Joint Standing Committee in 2008

2009 Q3
– Global imbalances and the financial crisis
– Household saving
– Interpreting recent movements in sterling
– What can be said about the rise and fall in oil prices?
– Bank of England *Systemic Risk Survey*
– Monetary Policy Roundtable

2009 Q4
– The financial position of British households: evidence from the 2009 NMG survey
– Accounting for the stability of the UK terms of trade
– Recent developments in pay settlements

2010 Q1
– Interpreting equity price movements since the start of the financial crisis
– The Bank's balance sheet during the crisis
– Changes in output, employment and wages during recessions in the United Kingdom
– Monetary Policy Roundtable

Bank of England publications

The Bank of England publishes information on all aspects of its work in many formats. Listed below are some of the main Bank of England publications. For a full list, please refer to our website:

www.bankofengland.co.uk/publications/index.htm.

Working papers

An up-to-date list of working papers is maintained on the Bank of England's website at:

www.bankofengland.co.uk/publications/workingpapers/index.htm

where abstracts of all papers may be found. Papers published since January 1997 are available in full, in portable document format (PDF).

No. 370 Banks' intraday liquidity management during operational outages: theory and evidence from the UK payment system (June 2009)
Ouarda Merrouche and Jochen Schanz

No. 371 Payment systems, inside money and financial intermediation (June 2009)
Ouarda Merrouche and Erlend Nier

No. 372 Funding liquidity risk in a quantitative model of systemic stability (June 2009)
David Aikman, Piergiorgio Alessandri, Bruno Eklund, Prasanna Gai, Sujit Kapadia, Elizabeth Martin, Nada Mora, Gabriel Sterne and Matthew Willison

No. 373 International financial transmission: emerging and mature markets (August 2009)
Guillermo Felices, Christian Grisse and Jing Yang

No. 374 How do different models of foreign exchange settlement influence the risks and benefits of global liquidity management? (August 2009)
Jochen Schanz

No. 375 Inflation dynamics with labour market matching: assessing alternative specifications (August 2009)
Kai Christoffel, James Costain, Gregory de Walque, Keith Kuester, Tobias Linzert, Stephen Millard and Olivier Pierrard

No. 376 Endogenous choice of bank liquidity: the role of fire sales (November 2009)
Viral V Acharya, Hyun Song Shin and Tanju Yorulmazer

No. 377 International spillover effects and monetary policy activism (November 2009)
Anna Lipińska, Morten Spange and Misa Tanaka

No. 378 Do supermarket prices change from week to week? (November 2009)
Colin Ellis

No. 379 Household debt, house prices and consumption in the United Kingdom: a quantitative theoretical analysis (March 2010)
Matt Waldron and Fabrizio Zampolli

No. 380 Evaluating and estimating a DSGE model for the United Kingdom (March 2010)
Richard Harrison and Özlem Oomen

No. 381 All together now: do international factors explain relative price comovements? (March 2010)
Özer Karagedikli, Haroon Mumtaz and Misa Tanaka

No. 382 Time-varying dynamics of the real exchange rate. A structural VAR analysis (March 2010)
Haroon Mumtaz and Laura Sunder-Plassmann

External MPC Unit discussion papers

The MPC Unit discussion paper series reports on research carried out by, or under supervision of, the external members of the Monetary Policy Committee. Papers are available from the Bank's website at:

www.bankofengland.co.uk/publications/externalmpcpapers/index.htm.

The following papers have been published recently:

No. 28 International comovements, business cycle and inflation: a historical perspective (July 2009)
Haroon Mumtaz, Saverio Simonelli and Paolo Surico

No. 29 Risk heterogeneity and credit supply: evidence from the mortgage market (February 2010)
Timothy Besley, Neil Meads and Paolo Surico

Monetary and Financial Statistics

Monetary and Financial Statistics (*Bankstats*) contains detailed information on money and lending, monetary and financial institutions' balance sheets, banks' income and expenditure, analyses of bank deposits and lending, external business of

banks, public sector debt, money markets, issues of securities, financial derivatives, interest and exchange rates, explanatory notes to tables and occasional related articles.

Bankstats is published on a monthly basis, free of charge, on the Bank's website at:

www.bankofengland.co.uk/statistics/ms/current/index.htm.

Further details are available from: Leslie Lambert, Monetary and Financial Statistics Division, Bank of England: telephone 020 7601 4544; fax 020 7601 3208; email leslie.lambert@bankofengland.co.uk.

Articles that have been published in recent issues of *Monetary and Financial Statistics* can also be found on the Bank's website at:

www.bankofengland.co.uk/statistics/ms/articles.htm.

Financial Stability Report

The *Financial Stability Report* is published twice a year. Its purpose is to encourage informed debate on financial stability; survey potential risks to financial stability; and analyse ways to promote and maintain a stable financial system. The Bank of England intends this publication to be read by those who are responsible for, or have interest in, maintaining and promoting financial stability at a national or international level. It is of especial interest to policymakers in the United Kingdom and abroad; international financial institutions; academics; journalists; market infrastructure providers; and financial market participants. It is available at a charge, from Publications Group, Bank of England, Threadneedle Street, London, EC2R 8AH and on the Bank's website at:

www.bankofengland.co.uk/publications/fsr/index.htm.

Payment Systems Oversight Report

The *Payment Systems Oversight Report* provides an account of how the Bank is discharging its responsibility for oversight of UK payment systems. Published annually, the *Oversight Report* sets out the Bank's assessment of key systems against the benchmark standards for payment system risk management provided by the internationally adopted Core Principles for Systemically Important Payment Systems, as well as current issues and priorities in reducing systemic risk in payment systems. Copies are available on the Bank's website at:

www.bankofengland.co.uk/publications/psor/index.htm.

Handbooks in central banking

The series of *Handbooks in central banking* provide concise, balanced and accessible overviews of key central banking topics. The *Handbooks* have been developed from study materials, research and training carried out by the Bank's Centre for Central Banking Studies (CCBS). The *Handbooks* are therefore targeted primarily at central bankers, but are likely to be of interest to all those interested in the various technical and analytical aspects of central banking. The *Handbook* series also includes '*Technical Handbooks*' which are aimed more at specialist readers and often contain more methodological material than the *Handbooks*, incorporating the experiences and expertise of the author(s) on topics that address the problems encountered by central bankers in their day-to-day work. All the *Handbooks* are available via the Bank's website at:

www.bankofengland.co.uk/education/ccbs/handbooks/index.htm.

The framework for the Bank of England's operations in the sterling money markets (the 'Red Book')

The 'Red Book' describes the Bank of England's framework for its operations in the sterling money markets, which is designed to implement the interest rate decisions of the Monetary Policy Committee while meeting the liquidity needs, and so contributing to the stability of, the banking system as a whole. It also sets out the Bank's specific objectives for the framework, and how it delivers those objectives. The framework was introduced in May 2006. The 'Red Book' is available at:

www.bankofengland.co.uk/markets/money/publications/redbookjan08.pdf.

The Bank of England Quarterly Model

The Bank of England Quarterly Model, published in January 2005, contains details of the new macroeconomic model developed for use in preparing the Monetary Policy Committee's quarterly economic projections, together with a commentary on the motivation for the new model and the economic modelling approaches underlying it.

www.bankofengland.co.uk/publications/other/beqm/index.htm.

Cost-benefit analysis of monetary and financial statistics

The handbook describes a cost-benefit analysis (CBA) framework that has been developed within the Bank to ensure a fair balance between the benefits derived from good-quality statistics and the costs that are borne by reporting banks. Although CBA is a well-established approach in other contexts, it has not often been applied to statistical provision, so techniques have had to be adapted for application to the Bank's monetary and financial statistics. The handbook also discusses how the application of CBA has enabled cuts in both the amount and the complexity of information that is required from reporting banks.

www.bankofengland.co.uk/statistics/about/cba.htm.

Credit Conditions Survey

As part of its mission to maintain monetary stability and financial stability, the Bank needs to understand trends and developments in credit conditions. This survey for bank and non-bank lenders is an input to this work. Lenders are asked about the past three months and the coming three months. The survey covers secured and unsecured lending to households and small businesses; and lending to non-financial corporations, and to non-bank financial firms.

www.bankofengland.co.uk/publications/other/monetary/creditconditions.htm.

Trends in Lending

This monthly publication presents the Bank of England's assessment of the latest trends in lending to the UK economy. The report draws mainly on long-established official data sources, such as the existing monetary and financial statistics collected by the Bank of England. But these data are supplemented by the results of a new collection, established by the Bank of England in late 2008, to provide more timely data covering aspects of lending to the UK corporate and household sectors. The Bank collects these data on behalf of the Lending Panel, which was established by the Chancellor in November 2008 to monitor lending to the UK economy, and to promote best practice across the industry in dealing with borrowers facing financial difficulties.

The Lending Panel comprises Government, lenders, consumer, debt advice and trade bodies, regulators and the Bank of England. See www.hm-treasury.gov.uk/press_126_08.htm.

Copies are available on the Bank's website at:

www.bankofengland.co.uk/publications/other/monetary/trendsinlending.htm.

Quarterly Bulletin

The *Quarterly Bulletin* provides regular commentary on market developments and UK monetary policy operations. It also contains research and analysis and reports on a wide range of topical economic and financial issues, both domestic and international.

www.bankofengland.co.uk/publications/quarterlybulletin/index.htm.

Inflation Report

The Bank's quarterly *Inflation Report* sets out the detailed economic analysis and inflation projections on which the Bank's Monetary Policy Committee bases its interest rate decisions, and presents an assessment of the prospects for UK inflation. The *Inflation Report* is available at:

www.bankofengland.co.uk/publications/inflationreport/index.htm.

The *Report* starts with an overview of economic developments; this is followed by five sections:

- analysis of money and asset prices;
- analysis of demand;
- analysis of output and supply;
- analysis of costs and prices; and
- assessment of the medium-term inflation prospects and risks.

Publication dates

Copies of the *Quarterly Bulletin, Inflation Report* and *Financial Stability Report* can be bought separately, or as combined packages for a discounted rate. Current prices are shown overleaf. Publication dates for 2010 are as follows:

Quarterly Bulletin

Q1	15 March
Q2	14 June
Q3	20 September
Q4	13 December

Inflation Report

February	10 February
May	12 May
August	11 August
November	10 November

Financial Stability Report

June
December

Quarterly Bulletin, Inflation Report and Financial Stability Report subscription details

Copies of the *Quarterly Bulletin* (*QB*), *Inflation Report* (*IR*) and *Financial Stability Report* (*FSR*) can be bought separately, or as combined packages for a discounted rate. Subscriptions for a full year are also available at a discount. The prices are set out below:

Destination	2010					
	QB, IR and *FSR* package	*QB* and *IR* package	*IR* and *FSR* package	*QB* only	*IR* only	*FSR* only
United Kingdom						
First class/collection[1]	£31.50	£27.00	£13.50	£21.00	£10.50	£5.25
Students/schools (concessionary rate UK only)	*£10.50*	*£9.00*	*£4.50*	*£7.00*	*£3.50*	*£1.75*
Academics (concessionary rate UK only)	*£21.00*	*£18.00*	*£9.00*	*£14.00*	*£7.00*	*£3.50*
Rest of Europe						
Letter service	£38.50	£33.00	£17.00	£25.00	£13.00	£6.50
Outside Europe						
Surface mail	£38.50	£33.00	£17.00	£25.00	£13.00	£6.50
Air mail	£50.00	£43.00	£21.50	£34.00	£17.00	£8.50

(1) Subscribers who wish to collect their copy (copies) of the *Bulletin, Inflation Report* and/or *Financial Stability Report* may make arrangements to do so by writing to the address given below. Copies will be available to personal callers at the Bank from 10.30 am on the day of issue and from 8.30 am on the following day.

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