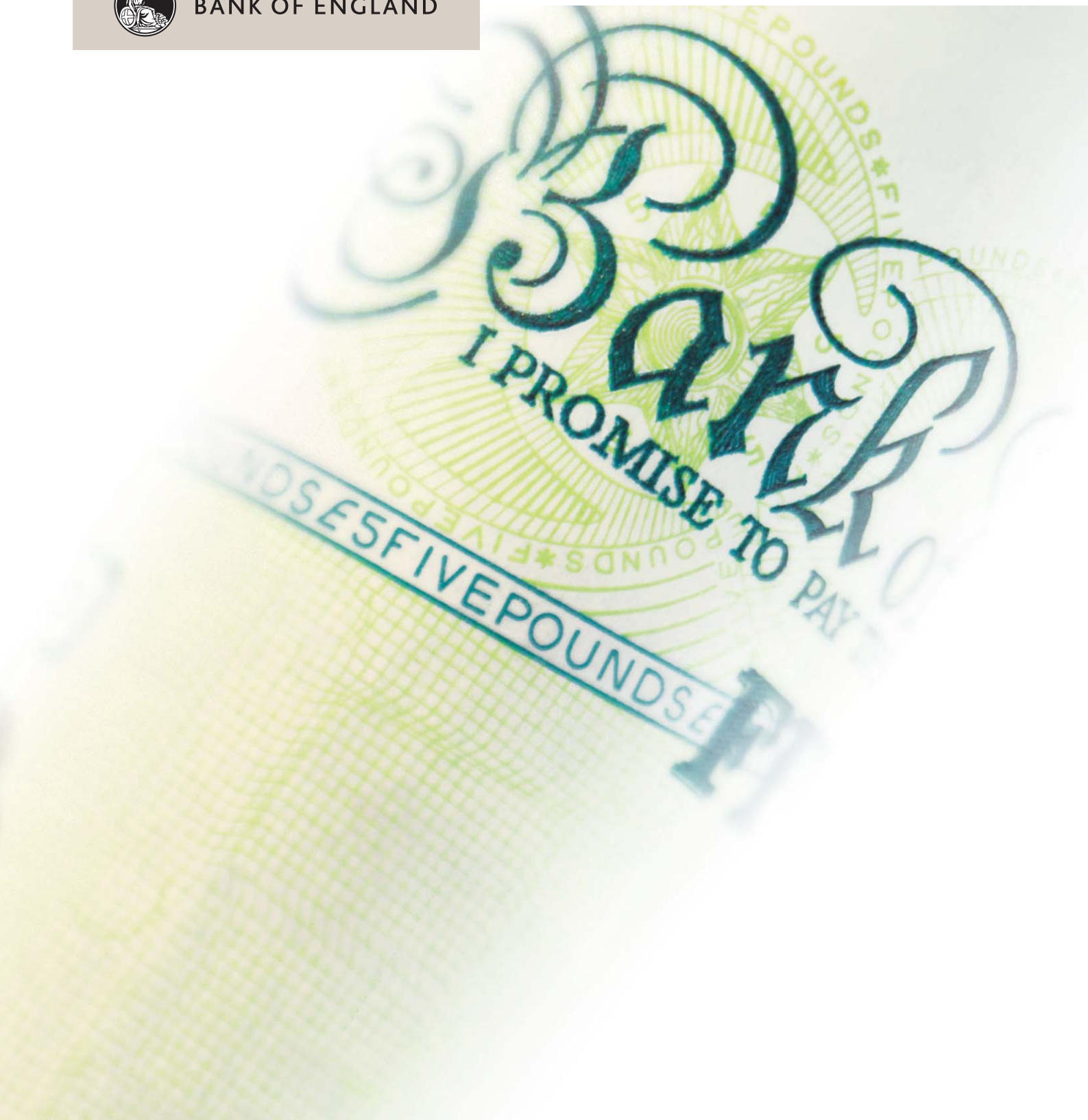


# Quarterly Bulletin

2006 Q4 | Volume 46 No. 4



BANK OF ENGLAND







BANK OF ENGLAND

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## Foreword

Every three months, the Bank of England publishes economic research and market reports in its *Quarterly Bulletin*. This quarter, the *Bulletin* explores the economic characteristics of immigrants into the United Kingdom. It examines the development of inflation-linked markets over recent years. It reports the key findings from a Bank-commissioned survey on the state of household finances. And it considers the practical issues involved in constructing a measure of 'private' or 'market' sector activity.

*The economic characteristics of immigrants and their impact on supply*, by Jumana Saleheen and Chris Shadforth, examines the available data on the economic characteristics of immigrants, particularly those who have entered the United Kingdom in the past two years. The data suggest that new immigrants differ in important ways from previous waves of immigrants and those born in the United Kingdom. It appears that they have relatively high levels of education but that they are more likely to be working in low-skilled, low-paid jobs. The increasing share of new immigrants in these types of jobs has led to a gap emerging between the wages of new immigrants and UK-born workers. However, the precise impact of these findings for the economy's supply capacity is complex as it also depends on the impact of the increased availability of migrant labour on the pay and employment of UK-born workers.

*Recent developments in the sterling inflation-linked markets*, by Grellan McGrath and Robin Windle, examines the development of the market for sterling inflation-linked instruments. These markets have grown significantly of late, involving a larger number of participants, a wider range of instruments and higher levels of market activity. The demand for inflation-linked cash flows by institutional investors, such as pension funds, has increased, and this has prompted new sources of supply of these products. It has also stimulated the rapid development of the market for inflation swaps, which help to reconcile mismatches in the timing and structure of the supply and demand. The article surveys these developments and considers some of the implications, for example for the way risk is transferred between different market participants.

*The state of British household finances: results from the 2006 NMG Research survey*, by Matt Waldron and Garry Young, reports the latest findings from an annual survey commissioned by the Bank. The survey revealed that there had been little change in the proportion of households who reported problems servicing their unsecured debt obligations, but a small increase in the proportion of households who had experienced difficulty in servicing their mortgage. However, the share of overall income accounted for by those households reporting difficulties was small, suggesting the impact on aggregate consumer spending is likely to have been limited.

*Measuring market sector activity in the United Kingdom*, by Rohan Churm, Sylaja Srinivasan and Ryland Thomas of the Bank's Monetary Analysis Division, and Sanjiv Mahajan, Fenella Maitland-Smith and Geoff Tily of the Office for National Statistics, discusses the various issues that arise when constructing measures of market sector gross value added for the United Kingdom. It presents some preliminary estimates consistent with the National Accounts, and discusses how the Bank of England uses these estimates when analysing demand pressures in the economy.

The regular *Markets and operations* article discusses recent developments in sterling financial markets. Short-term sterling market interest rates have risen and equity prices have increased over the past few months. That may reflect a perception on the part of market participants that the near-term downside risks to UK growth have lessened. In contrast, long-term sterling forward rates fell, approaching the lows recorded at the beginning of 2006. To some extent this was part of a general international fall in real long-term forward rates. But it may also have reflected further strong demand for long-dated UK government bonds by UK institutional investors. The article also reviews the first ten years of the gilt repo market, and looks at developments in the Bank's official operations since the previous *Bulletin*.

A handwritten signature in black ink, appearing to read 'C Bean', with a horizontal line underneath.

**Charles Bean**

Chief Economist and Executive Director for Monetary Policy, Bank of England.

**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.**

## Contents

### Recent economic and financial developments

---

<b>Markets and operations</b>	<b>356</b>
Box Sterling as a reserve currency	360
Box Ten years of the gilt repo market	364
Box The work of the Money Market Liaison Group in 2006	368
Box Collateral upgrade trades	371

### Research and analysis

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<b>The economic characteristics of immigrants and their impact on supply</b>	<b>374</b>
Box Data sources and definitions	376
<b>Recent developments in sterling inflation-linked markets</b>	<b>386</b>
Box Supply of non-gilt sterling inflation-linked assets	391
Box Inflation-linked asset swaps: connecting bond and swap markets	392
Box Seasonality and inflation-linked markets	394
<b>The state of British household finances: results from the 2006 NMG Research survey</b>	<b>397</b>
Box Survey method	403
<b>Measuring market sector activity in the United Kingdom</b>	<b>404</b>
Box An Input-Output Supply and Use Tables approach	408
Box Top-down estimates of market sector GVA in current prices using an expenditure approach	412
Box The procurement deflator	413
<b>Summaries of recent Bank of England working papers</b>	<b>415</b>
– Fundamental inflation uncertainty	415
– Returns to equity, investment and Q: evidence from the United Kingdom	416
– The yen real exchange rate may be stationary after all: evidence from non-linear unit root tests	417
– Exchange rate pass-through into UK import prices	418
– Bank capital channels in the monetary transmission mechanism	419
– Consumer credit conditions in the United Kingdom	420

### Speeches

---

<b>The Governor's speech at the Great Hall, Winchester</b>	<b>422</b>
Given on 10 October 2006	
<b>Trusting in money: from Kirkcaldy to the MPC</b>	<b>425</b>
The Adam Smith Lecture 2006 delivered by the Governor on 29 October 2006	
<b>The Governor's speech to the Black Country business awards dinner</b>	<b>432</b>
Given in Wolverhampton on 16 November 2006	
<b>International monetary stability — can the IMF make a difference?</b>	<b>434</b>
The GAM Gilbert de Botton Award Lecture delivered by Rachel Lomax, Deputy Governor responsible for monetary stability, on 1 November 2006	
<b>The puzzle of UK business investment</b>	<b>442</b>
Speech by Sir John Gieve, Deputy Governor and member of the Monetary Policy Committee, given at the University of the West of England on 26 September 2006	

<b>Hedge funds and financial stability</b>	<b>447</b>
Speech by Sir John Gieve, Deputy Governor responsible for financial stability, given at the HEDGE 2006 Conference on 17 October 2006	
<b>Practical issues in preparing for cross-border financial crises</b>	<b>452</b>
Speech by Sir John Gieve, Deputy Governor responsible for financial stability, given at the Financial Stability Forum Workshop: Planning and Communication for Financial Crises and Business Continuity Incidents on 13 November 2006	
<b>Reflections on my first four votes on the MPC</b>	<b>456</b>
Speech by Professor David Blanchflower, member of the Monetary Policy Committee, given at a breakfast with contacts of the Bank's Agency for Wales on 27 September 2006	
<b>Prudential regulation, risk management and systemic stability</b>	<b>464</b>
Speech by Alastair Clark, Adviser to the Governor of the Bank of England, given at the China International Banking Convention in Beijing on 20 October 2006	
<b>Globalisation and inflation</b>	<b>468</b>
Speech by Charlie Bean, Executive Director, Chief Economist and member of the Monetary Policy Committee, given to the LSE Economics Society, London School of Economics on 24 October 2006	

## Appendices

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<b>Bank of England speeches</b>	<b>478</b>
<b>Contents of recent Quarterly Bulletins</b>	<b>479</b>
<b>Bank of England publications</b>	<b>481</b>

The contents page, with links to the articles in PDF, is available at [www.bankofengland.co.uk/publications/quarterlybulletin/index.htm](http://www.bankofengland.co.uk/publications/quarterlybulletin/index.htm)

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The speeches contained in the *Bulletin* can be found at [www.bankofengland.co.uk/publications/speeches/index.htm](http://www.bankofengland.co.uk/publications/speeches/index.htm)

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 since the Q3 *Quarterly Bulletin* in sterling financial markets. It summarises asset price movements in conjunction with market intelligence gathered from market contacts, and evaluates them in the context of the Bank's core purposes. The article also outlines changes in market structure and reviews the Bank's official operations.<sup>(1)</sup>

## Sterling financial markets

### Overview

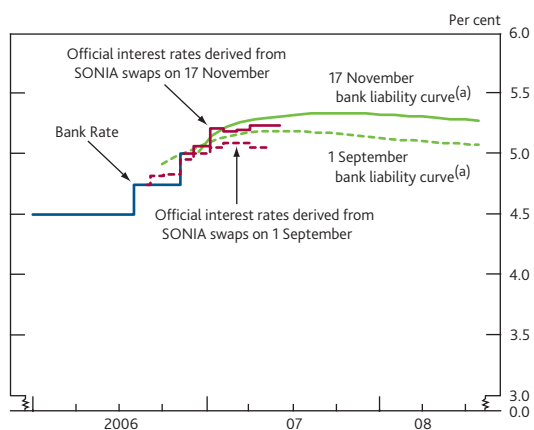
Short-term sterling interest rates rose and equity prices increased strongly over the past few months, perhaps consistent with market participants perceiving that the near-term downside risks to UK growth have lessened. In contrast, long-term sterling forward rates fell and approached the lows recorded in January 2006. To some extent this was part of an international fall in long-term real forward rates. But it may also have reflected further strong demand from institutional investors for UK government long-dated bonds.

Uncertainty surrounding future sterling asset prices generally fell further. In part, this also seemed to reflect market perceptions that the outlook for the UK economy remained robust.

### Recent developments in sterling markets

Since the previous *Bulletin*, the UK Monetary Policy Committee (MPC) increased Bank Rate by 25 basis points to

**Chart 1** Sterling official and forward market interest rates



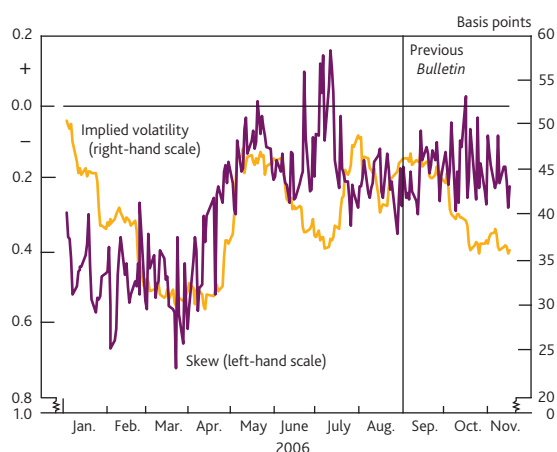
Sources: Bank of England and Bloomberg.

(a) One-day nominal forward rates implied by a curve fitted to a combination of instruments that settle on Libor.

5%. And looking ahead, the implied path of sterling money market interest rates shifted higher, with short-term forward rates increasing by up to 25 basis points. On 17 November, forward market interest rates derived from swaps on future sterling overnight interest rates (SONIA) implied some expectation of a further 25 basis point increase in Bank Rate during the first half of 2007 (**Chart 1**). Thereafter, the implied profile for market interest rates was broadly flat.

Implied uncertainty surrounding the expected near-term path of sterling rates decreased. But the skew of the implied distribution of future rates remained negative, suggesting that market participants perceived the balance of risks around the future path of interest rates to be slightly to the downside (**Chart 2**).

**Chart 2** Six-month implied volatility and skew from interest rate options



Sources: Bank of England and Euronext.Liffe.

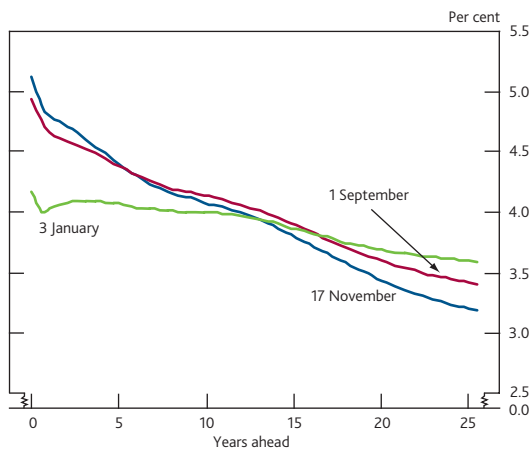
At longer horizons, nominal sterling forward rates fell, with the largest declines occurring at very long maturities. Taken together with the rise in short rates, this meant that the

(1) This article focuses on developments in sterling capital markets since 1 September (the data cut-off for the previous *Quarterly Bulletin*). The data cut-off for this article is 17 November.



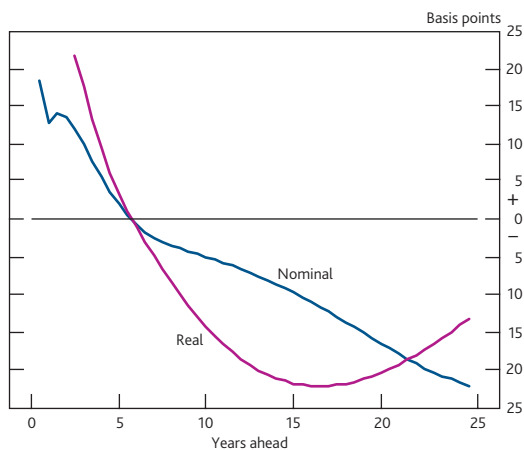
sterling forward rate curve became more inverted (ie downward sloping) (Chart 3). The fall in long-term nominal rates apparently reflected a decline in real interest rates, as the yields on index-linked gilts also fell (Chart 4). UK long-term breakeven inflation rates, derived from the difference between yields on conventional and index-linked gilts were relatively little changed over the period. But at short horizons they fell internationally, having picked up a little earlier in the year (Chart 5).

**Chart 3** Sterling nominal forward rates<sup>(a)</sup>



(a) Instantaneous forward rates derived from the Bank's government liability curve.

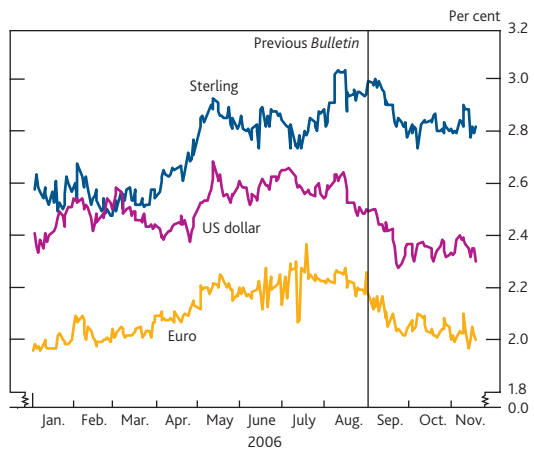
**Chart 4** Changes in sterling forward rates since 1 September<sup>(a)</sup>



(a) Instantaneous forward rates derived from the Bank's government liability curve.

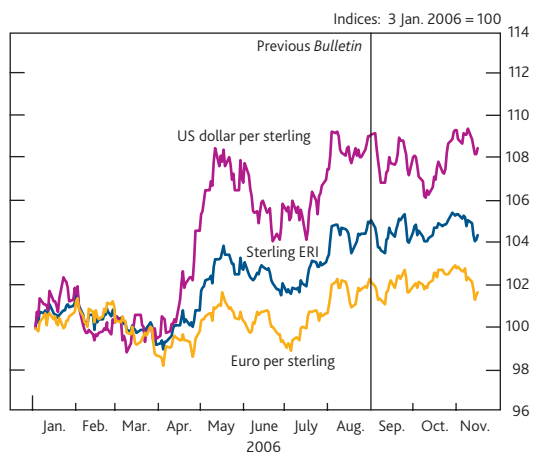
The sterling effective exchange rate index (ERI) ended the period a little lower, reflecting a slight depreciation against both the euro and the dollar, although it remained higher than its average level in the first half of the year (Chart 6). Realised and implied volatility in foreign exchange markets fell over the period, reaching low levels by recent historical standards (Chart 7). Furthermore, information from option prices suggested that market participants' views about the direction of future sterling exchange rate movements were broadly balanced.

**Chart 5** International two-year inflation forward rates<sup>(a)</sup>



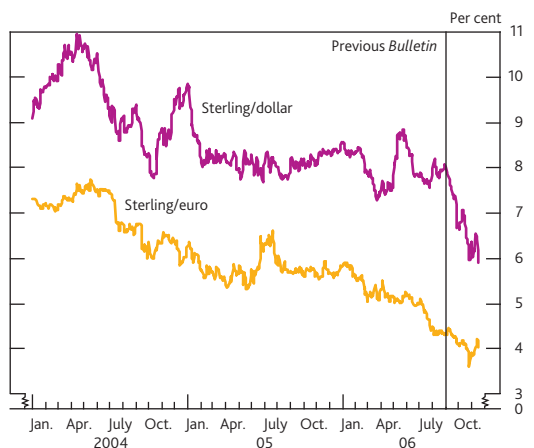
(a) Instantaneous forward rates. Dollar rates derived from the Bank's government liability curve. Sterling and euro rates derived from inflation swap rates. Dollar rates are based on 2 $\frac{1}{2}$ -year forward rate. Sterling rates referenced to RPI, dollar rates referenced to CPI and euro-area rates referenced to HICP.

**Chart 6** Cumulative changes in sterling exchange rates since 3 January 2006



Source: Bloomberg.

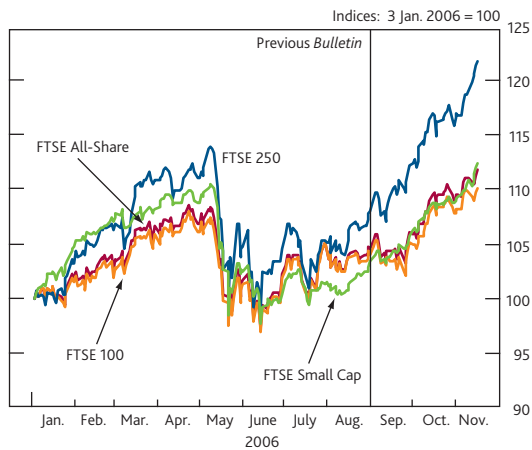
**Chart 7** Three-month implied sterling exchange rate volatility



Source: Reuters.

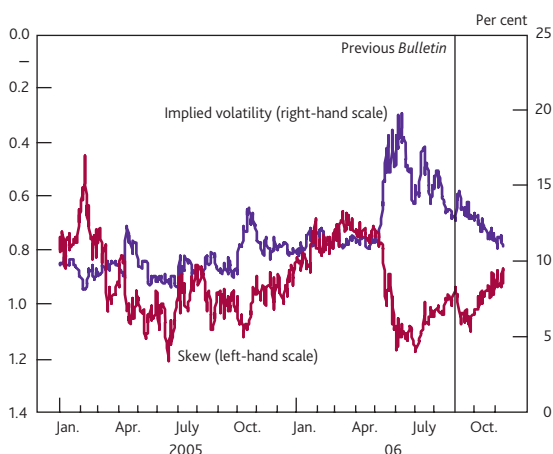
In line with most developed economies, UK equity prices continued to rise over the period, with particularly strong increases in the FTSE 250 index of medium-sized companies (Chart 8). Uncertainty surrounding expected future equity prices, as implied from equity index options, declined to levels similar to those observed prior to May and June (Chart 9). Furthermore, the implied distribution of future equity prices became less negatively skewed, implying that market participants attached less weight than previously to a large future downward movement in equity prices. Nevertheless, the skew remained slightly more negative than it was in mid-May (Chart 9).

**Chart 8** Cumulative changes in UK equity indices since 3 January 2006



Sources: Bloomberg and Bank calculations.

**Chart 9** FTSE 100 option-implied volatilities and skews(a)(b)



Sources: Bank of England and Euronext.liiffe.

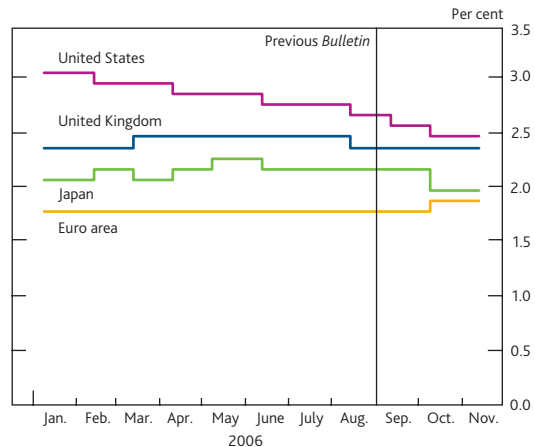
(a) Calculated from the distribution of returns implied from three-month options prices.  
 (b) A negatively skewed distribution is one for which large negative deviations from the mean are more likely than large positive deviations.

**Key recent influences on sterling markets**

Movements in sterling financial markets could have been consistent with the perceived healthy outlook for the UK economy. In particular, as discussed in the November 2006

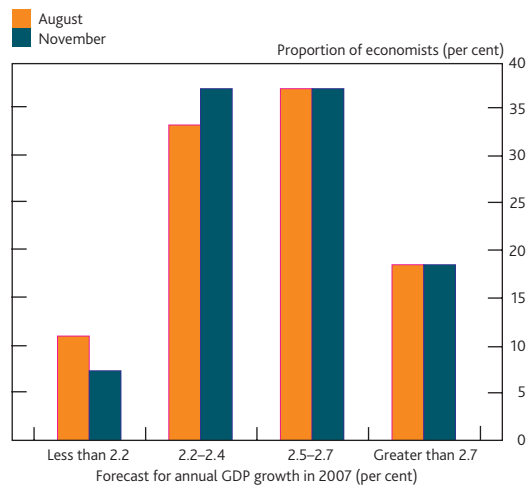
*Inflation Report*, UK domestic demand has continued to strengthen in recent quarters, despite the squeeze on real incomes associated with higher realised retail price inflation. Looking ahead, the average of economists' forecasts in November was for UK GDP growth to remain robust in 2007 (Chart 10). And the distribution of these forecasts showed fewer forecasters predicting a sharp weakening in economic growth next year (Chart 11).

**Chart 10** Expected real GDP growth for 2007



Source: Consensus Economics.

**Chart 11** Distribution of economists' forecasts for annual UK GDP growth in 2007



Source: Consensus Economics.

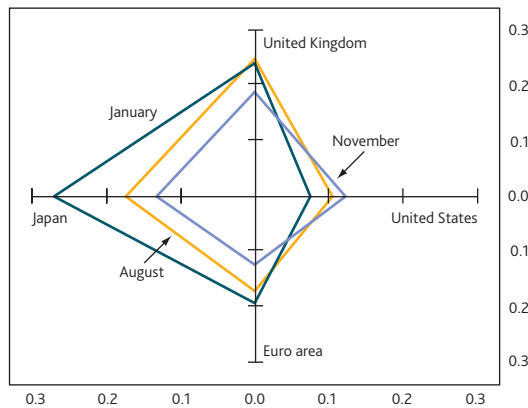
This robust outlook for the UK economy accords with stronger equity prices over the period, and may suggest that the fall in equity prices during May and June reflected a temporary increase in the equity risk premium rather than a reappraisal of underlying future earnings growth. The FTSE 250 index has outperformed the FTSE 100 by some margin (Chart 8), which might be consistent with the firms in the FTSE 250 index being more sensitive to cyclical changes,<sup>(1)</sup> although empirical

(1) Shares of some firms have a higher 'beta' than others, which means that, given the price of risk for all assets, movements in their prices are amplified.

evidence for this relationship is inconclusive. Alternatively, market contacts have suggested that medium-sized firms may have attracted further interest from hedge funds, seeking to exploit market inefficiencies and investing in relatively 'underresearched' mid-cap equities.

Consensus forecasts for growth in 2007 have not changed significantly for most of the major economies and indicate that continued robust growth is expected next year (Chart 10). However, forecasts for US GDP growth in 2007 were revised downwards during 2006. And the dispersion of these forecasts increased a little in recent months (Chart 12), perhaps reflecting economists' differing assessments of the possible effects of a slowdown in the US housing market on the wider economy.

**Chart 12** Dispersion of forecasts for real GDP growth for 2007 for the major economies<sup>(a)</sup>



Source: Consensus Economics.

(a) As measured by the coefficient of variation (standard deviation divided by the mean). A larger figure implies greater uncertainty.

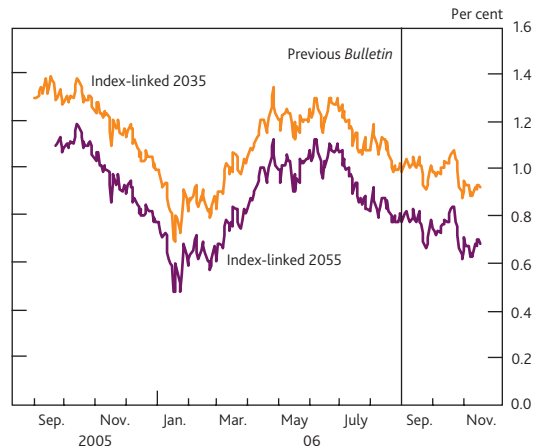
Against that economic backdrop, the strength in the sterling exchange rate during 2006 partly reflected changes in relative interest rates. In addition, as explained in the box on pages 360–61, holdings of sterling by overseas monetary authorities increased further in 2006. The associated investment flows have been small relative to overall turnover in foreign markets. But if other investors use official flows to inform their views about underlying fundamentals, changes in official holdings could have been another factor underpinning the appreciation of sterling through this year.

More generally, some market participants have also suggested that the actions of official investors could have contributed to the continued low levels of volatility in foreign exchange markets. Specifically, it is claimed that transactions by some monetary authorities have tended to limit upward and downward pressure on the major exchange rates due to the regular rebalancing of their portfolios to meet internal benchmarks.

## Recent developments in sterling long-term real interest rates

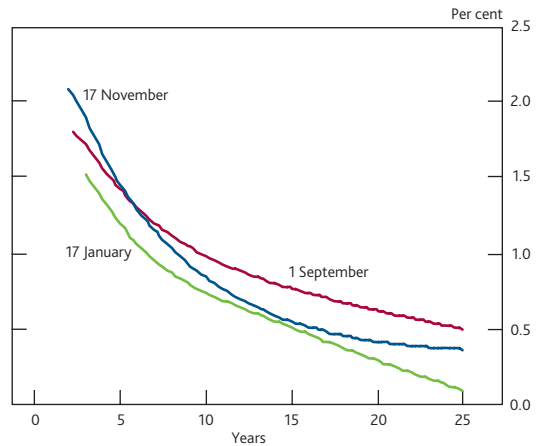
Recent falls have taken sterling long-term real rates back towards their January 2006 lows (Chart 13). The falls have also meant that the sterling real forward curve became more inverted (Chart 14).

**Chart 13** Real yields on index-linked gilts maturing in 2035 and 2055



Source: Bloomberg.

**Chart 14** Sterling real forward rates<sup>(a)</sup>



(a) Instantaneous forward rates derived from the Bank's government liability curves.

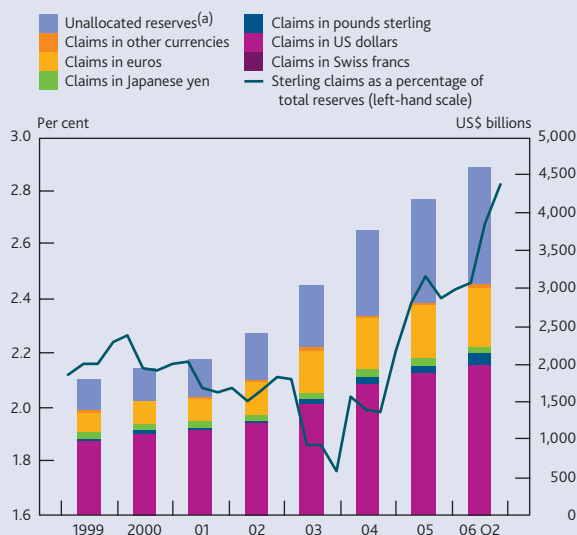
Long-term real rates have also fallen in overseas markets, suggesting that international factors have been important (Chart 15). As discussed in previous *Bulletins*, there are a number of possible reasons for the decline in global long-horizon real interest rates in recent years, although it is difficult to assess the relative importance of these different explanations.

One possible relevant factor is that market participants use developments in short-term interest rates to inform their views of long-term 'neutral' interest rates — that is, those rates that are consistent with economies growing at their

## Sterling as a reserve currency

According to the IMF's currency composition of official foreign exchange reserves (COFER) survey, reserves held by monetary authorities worldwide increased to US\$4.6 trillion in 2006 Q2, 16% higher than a year earlier (Chart A).

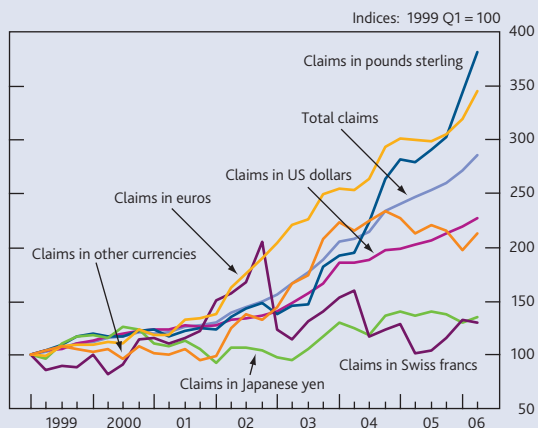
**Chart A** Official foreign exchange reserves by currency



Source: IMF.

(a) Refer to aggregate official reserves of countries that do not report currency composition data to COFER.

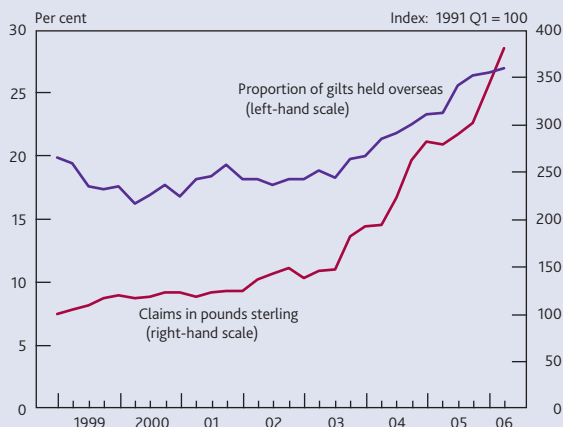
**Chart B** Cumulative changes in official foreign exchange reserves by currency



Source: IMF.

Within the total, the demand for sterling assets picked up (Chart B). In 2006 Q2, sterling reserves increased by approximately US\$13 billion, almost twice as much as in the whole of 2005, to just under US\$130 billion. As a result, the share of sterling-denominated assets in reserves portfolios increased to around 3%, apparently making sterling the third most held reserve currency behind the US dollar and the euro. The rising share of gilts held by overseas residents seems to be consistent with that (Chart C).

**Chart C** Official reserves held in sterling and proportion of gilts held by overseas investors



Sources: DMO and IMF.

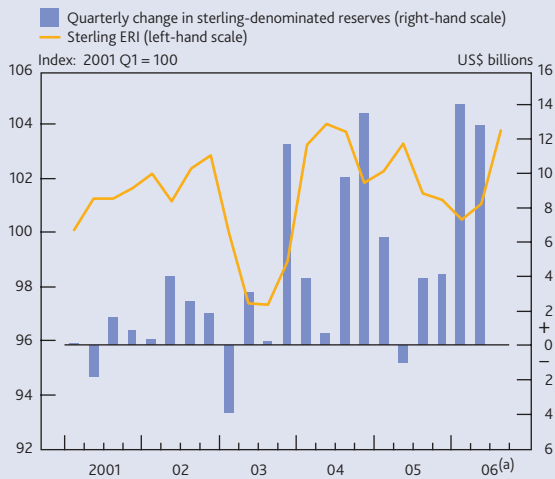
A number of factors have probably been influential.

First, the COFER data are denominated in US dollars. Sterling has appreciated against the dollar by around 18% since the beginning of 2003. Therefore, some of the increase in sterling's share of total dollar-denominated reserves will reflect this revaluation effect.

Second, increases in holdings of sterling assets could also have been motivated by a desire for higher-yielding assets, because in recent years short-dated sterling interest rates have been higher than those of other developed countries whose assets are typically held in reserves portfolios. Market contacts suggest that official institutions tend to hold relatively more short-dated compared with long-dated bonds. Although a positive interest rate differential might, in theory, have been expected to be offset by a currency depreciation, the relative stability of sterling over recent years could have increased the attraction of assets denominated in sterling.

Third, many developed and developing-country central banks seem to have adjusted the currency composition of their reserves in order to benefit from a more diversified portfolio. Over the past couple of years, for example, the Italian, Swiss, Norwegian and Russian central banks have publicly announced increases in their exposures to sterling.

The increase in sterling-denominated official reserves over the past year has been widely quoted by market participants as a likely factor underpinning the strong performance of the sterling ERI. However, Chart D suggests that any relationship between reserve flows and the exchange rate is weak. In the period since the beginning of 2005 to 2006 Q1 the sterling ERI declined steadily despite significant increases in reserves. When the sterling ERI began to rise in 2006 Q2 the quarterly increase in sterling reserves was still significant, but lower than in Q1.

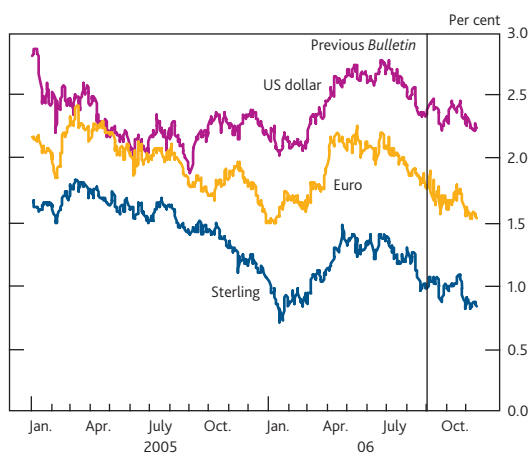
**Chart D Sterling reserves and the sterling ERI**

Sources: Bank of England and IMF.

(a) Data not yet available from sterling-denominated reserves for 2006 Q3.

The weakness in any empirical relationship between changes in official reserves and the value of sterling is perhaps not surprising since sterling-denominated official reserve flows still

trend growth rates and actual output equal to potential output. The neutral rate is determined by a range of supply-side factors, including productivity growth, investment and the size and quality of the labour force. So while the long-run neutral rate may change over time, in theory it should not move in response to short-term news. Put another way, it is hard to understand why news about the economic conjuncture should affect the expected policy rate ten years hence.

**Chart 15 International ten-year real forward rates**

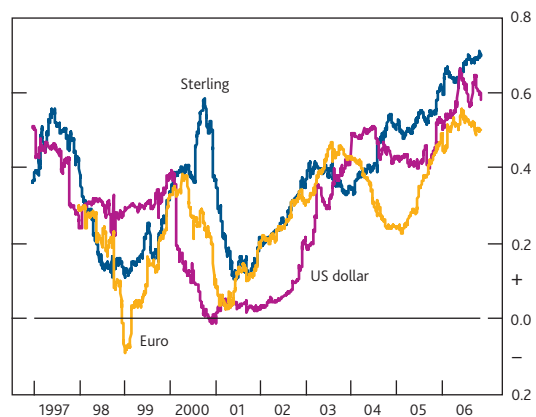
However, market participants may use news about cyclical economic conditions to update their views on the neutral rate, which might explain why long-term and short-term interest rates have tended to react to the same economic news. Consistent with that possibility, the correlation between long and short forward rates has risen in recent years (Chart 16),

represent a relatively minor share of total foreign exchange market activity. In 2006 Q2, the increase in known sterling official reserves was US\$13 billion, compared with an average daily foreign exchange market turnover in April 2006 of approximately US\$1 trillion.<sup>(1)</sup>

However, regardless of their size, official institutional flows may still influence the investment decisions of some market participants who use them to infer underlying information about the fundamental determinants of exchange rates. Moreover, monetary authorities are perceived to have become more important players in foreign exchange markets. For example, some market participants have attributed the recent low levels of foreign exchange volatility to the actions of managers of official reserves who rebalance currency holdings to maintain portfolios in line with currency benchmarks. This typically requires them to buy currencies that have depreciated and sell those that have appreciated.

(1) For more details, see the results of the semi-annual foreign exchange turnover survey by the Joint Standing Committee available on the Bank of England website.

with an increasing correlation between long-term real forward rates and short-term nominal rates (Chart 17).

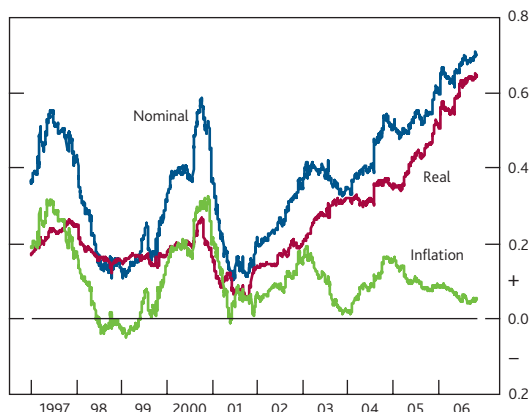
**Chart 16 Comovement between changes in international nominal forward rates at one-year and ten-year horizons<sup>(a)</sup>**

Source: Bank of England calculations.

(a) This chart plots the coefficient from a regression of daily changes in ten-year nominal forward rates on daily changes in one-year nominal forward rates over a one-year rolling window.

An alternative possible explanation is that movements in global long-term interest rates have been driven by changes in 'real term premia' — the compensation required by investors for uncertainty about future real returns. Such term premia should, in theory, depend on investors' perceptions of uncertainty surrounding future pay-offs on index-linked bonds and also the degree to which investors dislike uncertainty about those pay-offs.

**Chart 17** Comovement between one-year and ten-year sterling nominal, real and inflation forwards<sup>(a)</sup>

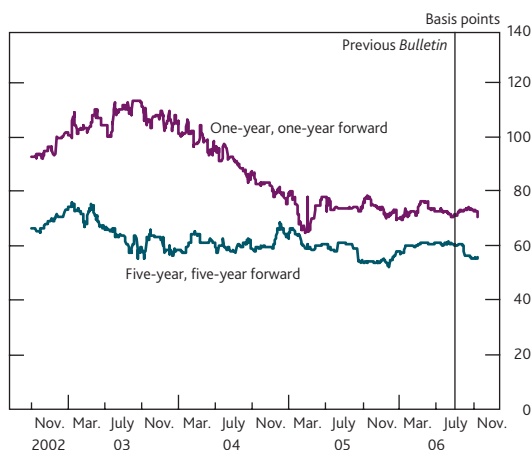


Source: Bank of England calculations.

(a) This chart plots the coefficient from separate regressions of daily changes in ten-year sterling nominal, real and inflation forward rates on daily changes in one-year nominal forward sterling rates over a one-year rolling window.

Changes in perceived uncertainty should be reflected in implied volatilities derived from option prices. Options on real long-term bonds are not widely traded. But forward implied volatility derived from sterling nominal swaptions has remained broadly stable at long horizons in recent years (Chart 18).

**Chart 18** Forward implied volatility from sterling swaptions



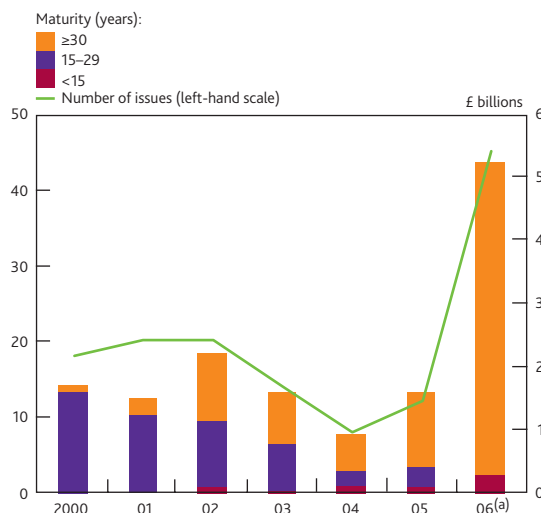
Source: JPMorgan Chase & Co.

Instead, changes in term premia might reflect a shift in investors' risk preferences. One interpretation is that the marginal buyers of long-dated index-linked debt have become more willing to pay a premium for these assets. In the UK context, such an explanation might be consistent with widespread reports of strong institutional demand for long-dated index-linked bonds, particularly from pension funds. These institutions typically have long-term inflation-linked liabilities they wish to hedge,<sup>(1)</sup> and hence might have a strong preference for index-linked bonds to ensure they receive real cash flows over long-time horizons.

Put another way, the returns on index-linked gilts may incorporate negative real term premia. That is, rather like entering into an insurance contract, investors may be willing to pay a higher price for index-linked securities because the pay-offs may be received in states of the world when they are most valued.<sup>(2)</sup>

Recently, market contacts have reported stronger institutional demand for long-dated index-linked gilts, and this coincided with renewed falls in long-term sterling real rates. That occurred despite a notable increase in very long-dated sterling index-linked issuance by firms during 2006, largely reflecting issuance by utility companies (Chart 19).

**Chart 19** Non-government sterling inflation-linked bond issuance



Source: Dealogic.

(a) Year to 17 November.

**Interpreting moves in UK breakeven inflation rates**

Investors' risk preferences could also be important for interpreting developments in breakeven inflation rates. More specifically, if institutional investors have become more willing to pay a premium for index-linked gilts to guarantee real cash flows and there has been no equivalent effect on the conventional gilt market, this would have tended to push up observed breakeven inflation rates.

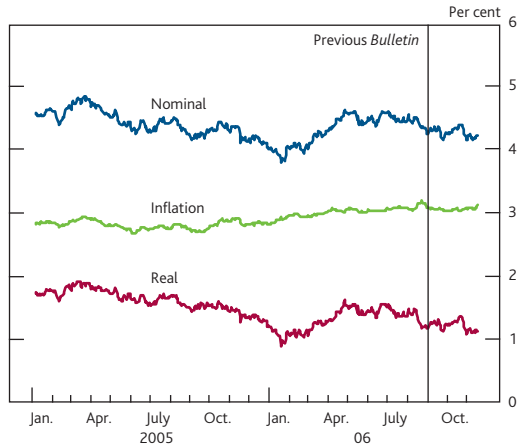
In fact, over the past few years breakeven inflation rates have been much less volatile than nominal or real rates, which have generally moved in tandem (Chart 20). Some market contacts have said this was because traders typically have a clearer view of what they consider an appropriate level for inflation compensation, at least at medium-term horizons, given the

(1) See the box entitled 'Pension fund valuation and liability driven investment strategies' in the Spring 2006 Quarterly Bulletin, pages 8–9.

(2) For a fuller discussion of the influence of risk premia on global real rates see the box 'Real interest rates and macroeconomic volatility' in the Autumn 2005 Quarterly Bulletin, pages 308–09.

explicit inflation target in the United Kingdom. Hence the yields on conventional bonds have tended to move in line with those on index-linked bonds, whereas breakeven rates have traded in a narrower range.

**Chart 20** Sterling five-year forward rates<sup>(a)</sup>



(a) Five-year rates starting five years forward derived from the Bank's government liability curves.

Nevertheless, sterling breakeven inflation rates drifted up a little during 2006 (Chart 20). That could have reflected either an increase in market participants' expectations of future inflation or a larger inflation risk premium to compensate investors for the uncertainty about future inflation. But as noted in the November 2006 *Inflation Report*, survey evidence did not show a pickup in long or medium-term expected inflation. And discussions with market contacts suggested that there was not a widespread increase in investors' medium-term inflation expectations. Instead, the recent rise in breakeven inflation rates could have been because market participants revised up their assessment of future inflation volatility a little in the light of recent inflation outturns.

A further consideration is whether particular structural features of the sterling inflation-linked market could also have been important in explaining recent developments in breakeven inflation rates. The sterling inflation-linked market has developed substantially in recent years, both in terms of size and efficiency, as explained in the article on pages 386–96. However, there remain market frictions, which may influence observed market rates, at least temporarily. For example, the index-linked market tends to be less liquid than the conventional gilt market.

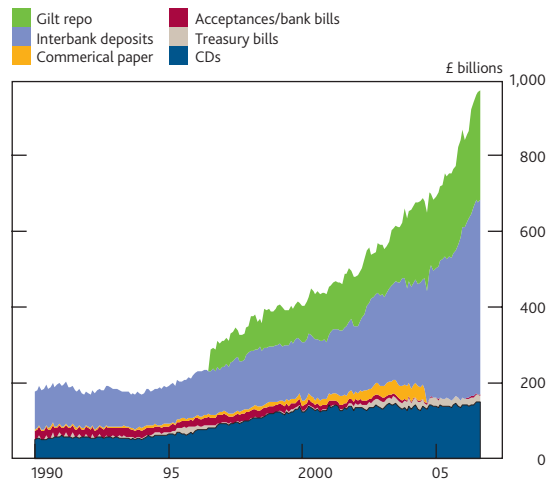
## Developments in market structure

### Ten years of the gilt repo market

The gilt repo market is now ten years old. Its introduction in January 1996 was one of the most significant changes to the structure of sterling financial markets since 'Big Bang' in 1986.

The gilt repo market quickly developed into the major sterling market in secured money. It grew alongside the existing unsecured money markets, and over time there has been a shift towards gilt repo taking a larger share of sterling money market transactions (Chart 21). Having monitored the initial growth in scale and depth of the market, in 1997 the Bank started conducting open market operations in gilt repo. The box on pages 364–65 provides more detail on how the market has developed and reviews the reasons for it being established.

**Chart 21** Sterling money market assets



In July 2000, the Bank's Central Gilts Office was merged into CREST. Since then, settlement of gilt repo transactions has been in CREST, either against deliveries of specific gilts or using the delivery-by-value (DBV) mechanism. DBVs are overnight collateral deliveries used to settle repos and securities loans where the intention is to finance a basket of collateral rather than deliver specific securities. The merger was part of the creation of a single settlement system for gilt, money market and equity transactions in order to create a more efficient and effective UK securities settlement system. Harmonisation and consolidation of settlement systems has continued, for example via Euroclear's initiative to consolidate its domestic settlement services — including CREST — into a single platform for European settlement.

### CREST settlement

The 2006 Q3 *Quarterly Bulletin* reported that the daily settlement of UK securities in CREST had been completed later than scheduled during a short period following the transfer of major aspects of CREST settlement to Euroclear's Single Settlement Engine (SSE) on 28 August.

CREST has implemented a package of changes designed to improve performance, particularly in the processing of DBVs. These restored the settlement timetable to normal. Also, additional flexibility has been created to keep the market for US dollar-denominated DBVs open later, as an additional financing option, by separating the US dollar and euro currency

## Ten years of the gilt repo market

The gilt repo market began on 2 January 1996 and was one of the most significant changes to the structure of sterling financial markets since 'Big Bang' in 1986. This box looks back at its introduction and considers its development during the past decade.

A gilt sale and repurchase (repo) transaction involves one party agreeing to sell gilts to another party with a legally binding commitment to repurchase equivalent gilts at an agreed price at a specified future date. Gilt repo provides a mechanism for, in effect, 'borrowing/lending' cash against gilt collateral and also for 'borrowing/lending' particular gilts.

Until 1996, a variety of regulations limited which institutions could lend and borrow gilts, and the intermediaries through which such transactions had to be made. The creation of what was referred to at the time as an 'open' gilt repo market made it possible for all financial institutions to transact in gilt repo. That meant anyone could finance outright short positions (ie sell gilts they did not own) by taking delivery of gilts via reverse repos. In parallel, the gilt stock lending market was liberalised so that end-investors in gilts, such as pension funds and insurance companies, could lend them against the collateral of other securities, such as bank certificates of deposit.

To facilitate the successful introduction of the market, various further changes were introduced by the authorities. These included the development of a market standard legal agreement, changes to settlement systems and changes to tax on gilt dividend (coupon) payments. And in order to avoid market disruption caused by malpractice, which had occurred in some overseas bond repo markets, market practitioners and regulators worked with the Bank to draw up recommended market practices. These were set out in a Code of Best Practice.

### Gilt repo and the sterling money markets

The gilt repo market quickly developed into the major sterling market in secured money. By the end of 1996, gilt repo comprised around 20% of the stock of sterling money market assets. By mid-2006 this had increased to around 30%.

The gilt repo market has become an important financing mechanism for many gilt market participants. Banks and others will often use other securities (eg certificates of deposit, corporate bonds and asset-backed securities) as collateral to borrow gilts from lenders, such as pension funds and insurance companies, at a fee, in order to deliver the gilts in the repo market to raise cash. In this way, the gilt stock lending and repo markets can be used together to finance holdings of a wider range of securities.<sup>(1)</sup> Gilt repos are also

used to take positions on the future level of short-term interest rates.

### Monetary policy

Following the initial growth in the gilt repo market, the Bank decided in 1997 to make gilt repo the primary instrument used in its open market operations (OMOs). This increased the pool of collateral eligible for use in OMOs and, at the time, reduced the strain on the eligible/commercial bill market. Since then, the Bank has added European government and supranational securities to the pool of collateral for its OMO repo operations. But gilt repo has remained the largest part of the Bank's OMOs, even after its recent money market reforms.

### Impact on the gilt market

The gilt repo market has also come to play a central role in the market for UK government bonds and created new possibilities for participants in this market.<sup>(2)</sup>

- Liquidity in the gilt market has increased, in part because dealers can cover short positions in gilts more easily using gilt repo.
- Arbitrage in the gilt market has been aided by the extension of the ability to take short positions in gilts to all wholesale market participants. This, together with the greater liquidity, has made pricing anomalies less likely to persist and short-term changes in supply and demand more easily absorbed.

### Implications for the banking system

The gilt repo market has provided UK banks with a new tool for managing liquidity and credit risk. For example, by permitting secured lending and borrowing, gilt repo has allowed banks to manage their sterling liquidity with less credit exposure, hence allowing more efficient use of capital. And, in combination with the expansion of eligible collateral in the Bank's OMOs, gilt repo has enabled many market participants to switch their holdings between a wide range of different types of European government securities to optimise their risk and return.

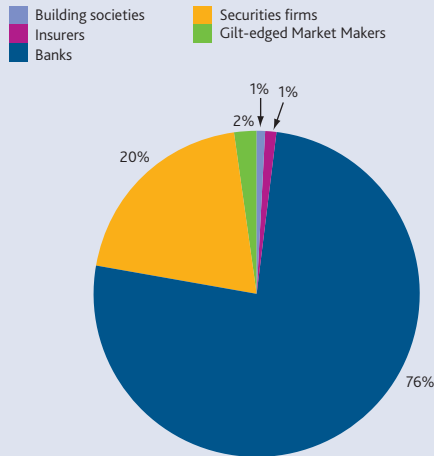
Banks remain the most active participants, accounting for around three quarters of the amount of gilt repo outstanding (**Chart A**), compared with around two thirds a decade ago. The large UK retail banks hold gilts as part of their prudential stock of high-quality liquid assets in order to meet day-to-day liquidity needs and regulatory requirements.<sup>(3)</sup> In the past, banks typically bought gilts outright but that has changed and banks now almost entirely borrow gilts through the repo market on a term basis for this purpose.

The greater use of secured funding compared with borrowing in unsecured money markets reflects a desire of banks to



reduce their credit risk. Spreads between secured and unsecured overnight rates have been volatile but are currently at broadly similar levels to those in early 1996.

**Chart A** Share by institutional type in gilt repo market<sup>(a)</sup>



(a) Data refer to August 2006.

### Evolution of the structure of the gilt repo market

One important structural change is that, since 2002, it has been possible for all market participants to trade with each other through a central clearing counterparty, the London Clearing House (LCH), which reduces participants' balance sheet usage as positions with the LCH can be netted against each other, and facilitates anonymous trading. Another is that settlement of gilt repo transactions is now carried out by CRESTCo following the transfer, in July 2000, to CREST of the Bank's Central Gilts Office in 1996.

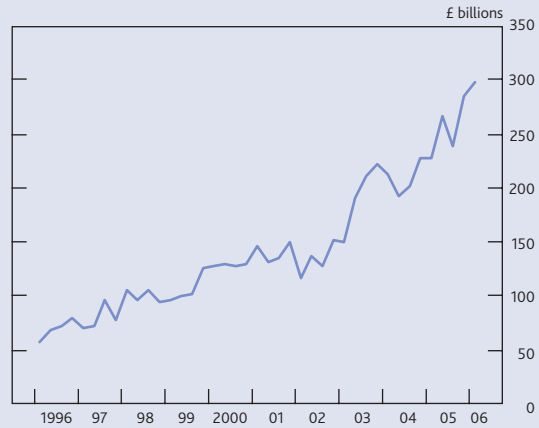
The way that brokers operate has also changed, with electronic broking increasing. That has increased the ease with which participants can view rates and the size of bids and offers in the market, promoting liquidity, though a significant amount of trading is still conducted bilaterally or through voice brokers.

The stock of outstanding repo transactions has risen to around £300 billion, according to the Bank's quarterly survey of repo market participants (**Chart B**). Turnover has also risen from around £7 billion per day in early 1996 to around £40 billion in the quarter ending August 2006. Around two thirds of this turnover has a maturity of one or two days. This is much the same as a decade ago — only around 5% of overall turnover is for a maturity of one month or longer.

But while the market has evolved greatly in the past decade, its framework remains largely the same. Through the Securities Lending and Repo Committee (SLRC) and Money Market Liaison Group, the Bank is currently facilitating a

market debate on the continued need for a Gilt Repo Code now that the market is well established.<sup>(4)</sup>

**Chart B** Gilt repo amounts outstanding



Overall, the development of the gilt repo market has had a profound impact on the sterling money markets and the gilt-edged market. They now benefit from greater liquidity, a more developed market in secured money, lower financing costs and improved hedging opportunities.

(1) See the box on collateral upgrade trades on page 371.

(2) Since the Bank introduced gilt repo, there have been other important changes to the gilt market, including responsibility for UK debt management being transferred to the Debt Management Office in 1998.

(3) Gilts are included within the category of assets allowable as high-quality liquidity under the FSA's Sterling Stock Liquidity Regime.

(4) The SLRC continues to bring together market practitioners and the authorities to discuss structural (including legal) developments. Recent work by the SLRC is described in the box on pages 136–37 of the Summer 2006 *Quarterly Bulletin*.

**Table A** Simplified version of Bank of England consolidated balance sheet<sup>(a)(b)</sup>

£ billions					
Liabilities	8 Nov.	2 Aug.	Assets	8 Nov.	2 Aug.
Banknote issue	39	39	Short-term sterling reverse repo	31	34
Reserve account balances	16	21	Long-term sterling reverse repo	15	15
Standing facility deposits	0	0	Ways and Means advance	13	13
Other sterling deposits, cash ratio deposits and the Bank of England's capital and reserves	13	10	Standing facility assets	0	0
Foreign currency denominated liabilities	13	12	Other sterling-denominated assets	4	5
			Foreign currency denominated assets	16	15
<b>Total<sup>(c)</sup></b>	<b>80</b>	<b>82</b>	<b>Total<sup>(c)</sup></b>	<b>80</b>	<b>82</b>

(a) The Bank Charter Act 1844 requires the Bank of England to separate the note issue function from its other activities. Accordingly, the Bank has two balance sheets: Issue Department and Banking Department. See 'Components of the Bank of England's balance sheet' (2003), *Bank of England Quarterly Bulletin*, Spring, page 18.

(b) Based on published weekly Bank Returns. The Bank also uses currency, foreign exchange and interest rate swaps to hedge and manage currency and non-sterling interest rate exposures, see the Bank's 2006 *Annual Report*, pages 36–37.

(c) Figures may not sum to totals due to rounding.

deadlines. This had followed a few occasions when US dollar settlement (which previously had the same settlement deadline as euro DBV in CREST) was closed before DBVs could be processed owing to the deadline for closing of the pan-European TARGET euro payment system.

During the past few months, CREST settlement performance has been discussed at meetings of the Money Market Liaison Group and Securities Lending and Repo Committee, both chaired by the Bank. Members of the committees stressed the need for a clear timetable of proposed changes to be published for market participants. The Bank has a direct interest in CREST performance because cash settlement in CREST occurs across RTGS accounts at the Bank and gilt repo transactions as part of the Bank's operations to implement monetary policy settle in CREST.

Market contacts reported that delays in the processing of DBVs may have been increased by CREST users entering many trades close to the deadline typically associated with the financing of client's equity positions. CREST's link to the SSE meant that transactions now take slightly longer to reach settlement, so that market participants had greater uncertainty very near the deadlines. Some changes in business practices might be required.

### LCH plans for netting of gilt DBV repos

The 2006 Q3 *Quarterly Bulletin* also described LCH.Clearnet's plans for the extension of its gilt repo clearing service to gilt DBVs, planned for October 2006. That launch has been put back until there has been a sustained period of stability in CREST's DBV processing.

### Bank of England official operations<sup>(1)</sup>

The Bank's management of its balance sheet is directed to policy purposes. Changes in the Bank's assets and liabilities are, accordingly, related to the implementation of monetary policy through establishing Bank Rate in the money markets;

management of the Bank's foreign exchange reserves; provision of banking services to other central banks; provision of payment services for the UK financial system and wider economy; and management of the Bank's free capital and cash ratio deposits from financial institutions.

### Monetary policy implementation

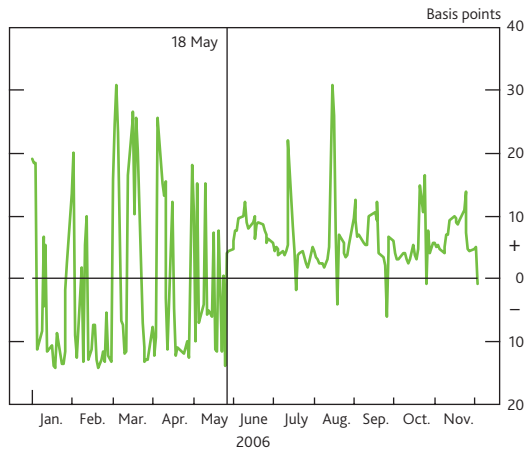
The overall size of the balance sheet fell over the review period, reflecting a reduction in banks' and building societies' target reserve balances (**Table A**). The 41 reserves scheme members chose to target around £18 billion in the maintenance period ending 6 September and around £16 billion in the period ending 8 November. More experience of the new reserves scheme may have prompted banks to reduce reserves targets — some banks held higher reserves immediately after the launch of the new framework for precautionary reasons. Some settlement banks also reverted to raising more of their intraday liquidity against eligible collateral rather than holding reserves for that purpose.

Active use of the reserves averaging scheme plays a key role in meeting the Bank's objective for overnight market interest rates to be in line with Bank Rate during the monthly maintenance periods. Over the review period, overnight unsecured rates, in general, continued to trade close to Bank Rate (**Chart 22**). Day-to-day volatility of unsecured sterling rates continued to compare favourably with that of overnight rates in other currencies (**Chart 23**).

As noted in the previous *Bulletin*, since the launch of the new framework, unsecured market rates have tended to rise relative to Bank Rate at month-ends, and at the end of July secured market rates fell sharply. This appears to be because some banks put limits on interbank lending around month-ends in order to reduce the size of their risk-weighted assets for internal and regulatory reporting purposes.

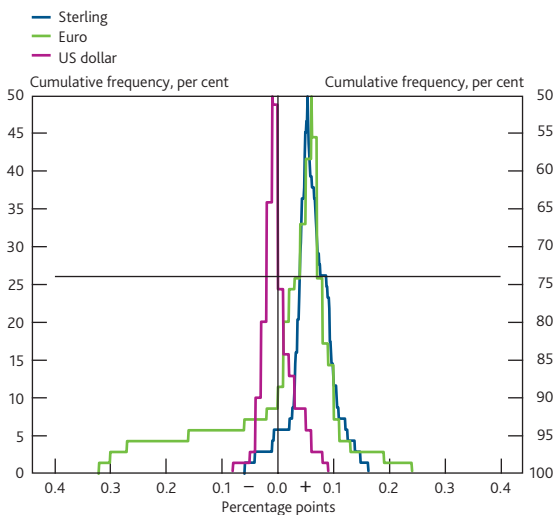
(1) This section reviews the three maintenance periods from 3 August to 8 November.

**Chart 22** Spread to Bank Rate of unsecured sterling overnight interest rates



Sources: Wholesale Market Brokers' Association and Bank calculations.

**Chart 23** Folded cumulative distribution<sup>(a)</sup> of spread of international unsecured overnight interest rates to official interest rates<sup>(b)</sup>



(a) Distribution of the spread between the overnight interest rate at end-of-day and the official interest rate. The distributions are folded at the median so that cumulative probabilities for values above (below) the median are indicated by the right-hand (left-hand) scale.

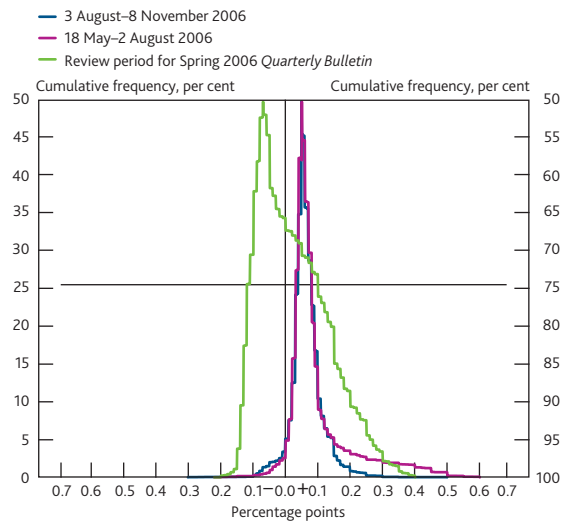
(b) Chart shows distribution for period 3 August to 8 November.

Over the current review period, month-end effects have continued but have been somewhat less pronounced. Those reserves scheme members without balance sheet constraints at month-ends have been able to arbitrage money market rates so that overnight unsecured rates have traded closer to Bank Rate. Reflecting this, the range of rates at which overnight unsecured trades were executed narrowed during the period, and the vast majority of trading occurred within 15 basis points of Bank Rate (**Chart 24**). Moreover, the majority of trading has taken place within a much narrower range of rates than was the case under the previous regime.

Volumes in the unsecured overnight market increased following a decline over the summer period, but then fell

ahead of the September quarter-end. Such falls are not uncommon at quarter-ends, though there is some evidence that the falls this year have become more pronounced, possibly consistent with a greater desire to reduce risk-weighted assets.

**Chart 24** Folded cumulative distribution<sup>(a)</sup> of spread of sterling unsecured overnight interest rate (trade weighted) to Bank Rate



Source: Wholesale Market Brokers' Association.

(a) The cumulative distribution function shows the percentage of trades executed at or below a given spread to Bank Rate. The distributions are folded at the median so that cumulative probabilities for values above (below) the median are indicated by the right-hand (left-hand) scale.

Secured overnight market interest rates have also tracked Bank Rate closely — almost all trades executed were within 10 basis points of Bank Rate. But there were a few days around the end of September, when the secured overnight rate increased relative to Bank Rate (**Chart 25**). Discussions with market contacts and at the Money Market Liaison Group (see box on pages 368–69) suggest that this reversal of the experience of end-July appears to have reflected caution among repo traders who were unwilling to put themselves in the position of needing to lend cash against gilt collateral after the end-July 'squeeze'. In response to the events of 31 July, the Bank made changes to its operational timetable to allow counterparties to substitute other types of collateral for gilts later in the day, and not just in the morning. That should help to alleviate any frictions in the supply of gilt collateral at month-ends and at other times. In the light of market feedback received on the Bank's plans to provide longer-term financing through outright bond purchases,<sup>(1)</sup> the Bank will consider lending its outright gilt holdings in due course.

The effectiveness of reserves averaging in keeping market rates in line with Bank Rate depends on the willingness of reserves

(1) See [www.bankofengland.co.uk/markets/money/documentation/consult\\_bond\\_purchases.pdf](http://www.bankofengland.co.uk/markets/money/documentation/consult_bond_purchases.pdf).

## The work of the Money Market Liaison Group in 2006

The Money Market Liaison Group (MMLG), chaired by the Bank of England, was established in 1999. It provides a high-level forum for discussion of market or structural developments affecting sterling money markets and related infrastructure and, where appropriate, responses to them. Typically, it meets quarterly and comprises representatives from market participants, trade associations and the authorities.

### Discussions of developments in the Bank of England's official operations

#### Money market reform

The MMLG has been the main discussion forum for issues arising from the Bank's reforms to its operations in the sterling money markets. Ahead of the launch of the reforms, the Bank liaised with the group at each stage, including discussing the dress rehearsal for participants and the start of the Bank's long-term repo open market operations (OMOs). Since the launch of the new framework, the MMLG has provided market participants with an opportunity to offer the Bank feedback on the changes.

Membership of the MMLG has been broadened to include representatives of institutions involved in the various components of the new operational framework (settlement banks, reserves scheme members, OMO counterparties and standing facility participants), ensuring that the Group reflects all parts of the sterling money markets. Following the reforms more than 60 banks, building societies and securities dealers participate in the Bank's new monetary policy implementation framework, consistent with the Bank's objectives to promote competitive and fair sterling money markets.

The MMLG has also been consulted on the Bank's proposals to provide long-term financing to the banking system through outright bond purchases, in particular regarding the mechanics of tenders. Members have also been invited to comment on the proposal that the Bank should move to electronic bidding for all of its OMOs.

The Group has also been used to communicate smaller technical changes to the Bank's operations, including proposals for the collateralisation of interest on repos; changes to the implementation of the Bank's collateral concentration limits; and the possibility of the Bank accepting delivery of euro-denominated collateral using Euroclear and Clearstream 'links' into national central securities depositories.

### Survey of sterling market participants

To help assess whether its money market reforms have achieved their objectives, the Bank intends to conduct an extensive survey of sterling money market participants, including end-users. Members have commented on the design, format and timing of the survey, which is expected to be carried out during the first quarter of 2007.

### Contingency planning

In the event of a crisis, the MMLG plays two co-ordinating roles. First, it provides a means of communication between sterling market participants via conference call arrangements. Second, if necessary, it makes recommendations on trading or market conventions in money markets.

The group has published — and updates regularly — a document detailing how decision-making in sterling money markets and their supporting infrastructure would work in a crisis, including the respective roles of the Bank, CREST, CHAPS and the MMLG.<sup>(1)</sup>

The MMLG is also sponsoring a sterling market 'live' contingency exercise, to be conducted in 2007. The intention is to move large parts of the sterling market to backup sites, with a skeleton team left at primary sites to be called upon in the event of any problems. The aim is to test the resilience of staffing contingency arrangements of major sterling money market participants, in particular their ability to communicate and trade with each other from their contingency sites, and not just in isolation. That follows up a recommendation made by the FSA as a result of its Resilience Benchmarking Project. A test on such a large scale as this will require careful planning.

MMLG has also discussed and approved the British Bankers' Association's (BBA) contingency plans for the continued publication of BBA Libor rates.

### The Operations Sub-Group

A key priority for 2006 was to establish an Operations Sub-Group, to provide a forum for discussion of important structural developments affecting trading, clearing, payments and settlement infrastructure in sterling markets. The Sub-Group was also tasked with addressing contingency planning, including testing — it has led on planning the sterling money market exercise described above and it participated in the market-wide exercise on planning for an influenza pandemic in October/November 2006.

The group comprises representatives from operations and treasury areas in a range of sterling market participants and infrastructure providers and meets quarterly ahead of MMLG meetings.

## Discussions/initiatives relating to wider issues for the sterling money market

### Euroclear proposals for a single platform

During 2006, the MMLG has monitored and offered feedback on Euroclear's proposals to migrate its national central securities depositories to a single platform. The first phase of this is the Single Settlement Engine (SSE), which concentrates on core settlement functionality. Major aspects of settlement for UK and Irish securities in CREST moved to the SSE at the end of August. The communication issues between CREST and the SSE, described on pages 363 and 366, were discussed in depth by the MMLG at its October 2006 meeting.

### LCH clearing of gilt DBV repo

The Group has also monitored and contributed views on LCH.Clearnet's plans to extend its central counterparty clearing service for gilt repo transactions to deliveries of gilts through CREST's delivery-by-value (DBV) service. Members of the MMLG expected the product to improve liquidity in the gilt repo market at longer maturities.

## Changes to UCITs rules for the eligibility of assets

The Group discussed an EU review of the eligibility of different asset types in UCITs vehicles, including money market funds. MMLG members had stressed the importance of the continued eligibility of bank certificates of deposits (CDs) for purchase by such funds.

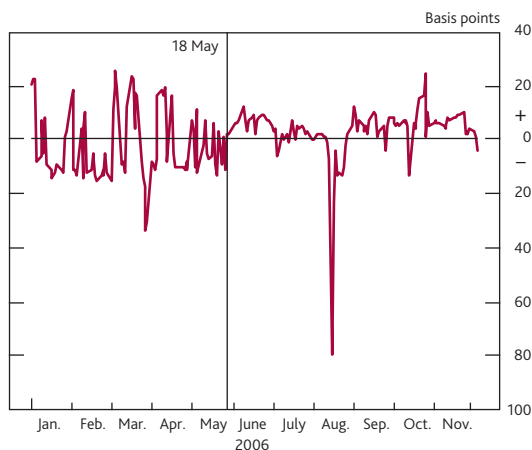
## Secured/unsecured spreads

Following volatility in the spread between overnight unsecured interbank rates and gilt repo rates at the ends of June and July, the Group discussed the causes of occasional collateral shortages and of higher unsecured rates at month-ends. Members emphasised constraints on banks' ability to lend unsecured in the overnight market because of a desire to limit reported risk-weighted assets; and a knock-on effect to the repo market if intermediaries reduced holdings of CDs that could be used to collateralise borrowing of gilts from securities lenders.

(1) The 'Contingency Matrix' is posted on the Bank's website, [www.bankofengland.co.uk/markets/money/contingency\\_matrix060317.pdf](http://www.bankofengland.co.uk/markets/money/contingency_matrix060317.pdf).

scheme members to vary their reserves balances actively in response to changes in market interest rates.

**Chart 25** Spread to Bank Rate of secured market interest rates<sup>(a)</sup>

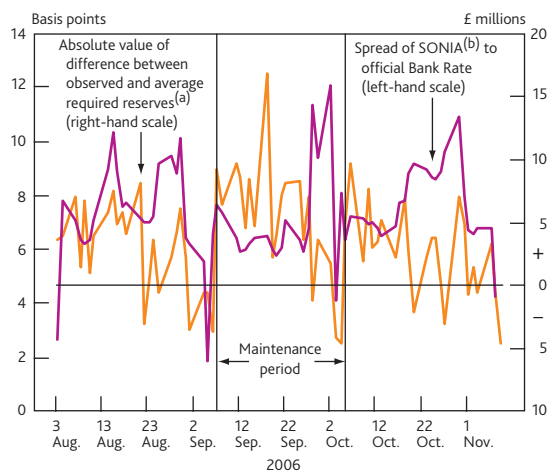


(a) ICAP GC overnight repo fixing less Bank Rate.

Over the review period, there was evidence of more active management of reserves among scheme members as a whole, despite a fall in the level of aggregate target reserves. One way of gauging the degree of active management is the difference between each bank's actual reserves balance at the end of each day and the average balance it would have needed to hold over the remainder of the maintenance period in order to hit its reserves target exactly. **Chart 26** shows the sum of (the absolute value of) this difference across all reserves scheme members; a higher value indicates more active

reserves management. Active management appears to have, in general, been slightly greater in the past few maintenance periods, which may reflect greater experience of the new system and is consistent with unsecured overnight rates trading close to Bank Rate.

**Chart 26** Reserve averaging and spread of sterling unsecured overnight market interest rate to Bank Rate



(a) The line indicates the extent to which reserves scheme members were actively managing their reserve accounts. For each day, it sums the absolute difference between each member's observed balance and the average balance it would have needed to hold in order to hit its reserve target. Higher values suggest a greater degree of active reserves management.  
(b) Sterling overnight index average.

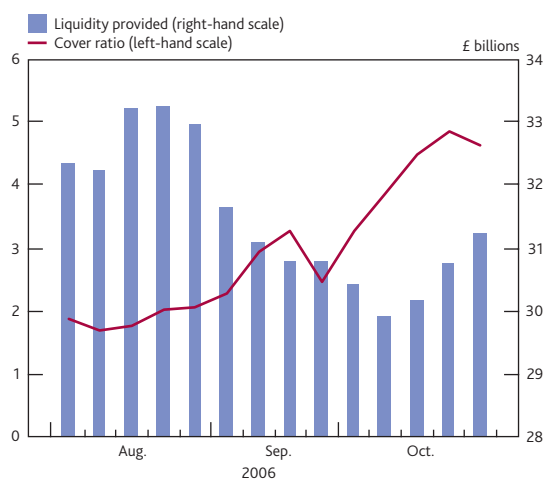
In its open market operations (OMOs), the Bank aims to supply enough cash so that all scheme members can achieve their reserves targets exactly, at the mid-point of the  $\pm 1\%$  range around these targets within which reserves are

remunerated at Bank Rate. Reserves scheme members face interest penalties if they hold a balance outside (either above or below) the target range.<sup>(1)</sup> Excess reserves above the top of the target range are not remunerated. Any shortfalls of reserves below the target range are charged at Bank Rate and deducted from the interest paid.

Over the review period 'excess' reserves totalled £1.5 billion, implying foregone interest of more than £215,000. These excess reserves arose owing to errors in the liquidity management of some reserves scheme members. So far, there have been no instances of a reserve bank holding a balance below its target range.

The Bank corrects for any excess reserves in its weekly or fine-tune OMOs to ensure that other reserves scheme members are still able to meet their reserves targets exactly. Over the review period, the size of the weekly short-term OMO fell, reflecting the reduction in aggregate reserves targets. Cover (the ratio of bids to the amount on offer) in the short-term OMOs increased steadily for the first six weeks of the period and more rapidly in October (Chart 27). The concentration of short-term OMO allocations — as measured by a Herfindahl index<sup>(2)</sup> — decreased.

**Chart 27** Liquidity provided in weekly operations and cover ratio

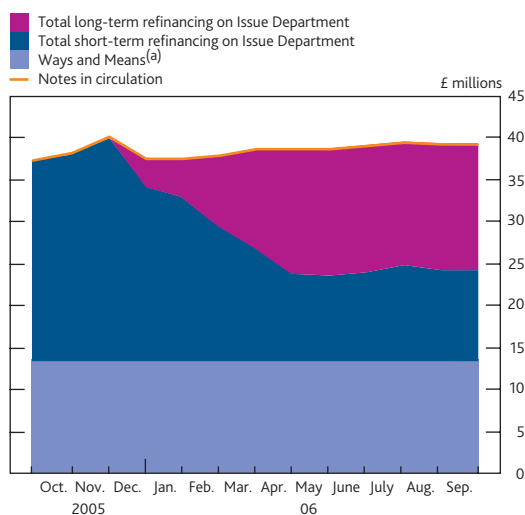


Two fine-tuning OMOs were conducted. On 6 September, the fine-tune supplied reserves of £4.7 billion. This was the largest fine-tune to date, reflecting a combination of standing deposit facility usage, some banks holding excess reserves and other movements in 'autonomous factors'.<sup>(3)</sup> On 8 November, the fine-tune drained £2.4 billion of reserves from the system, reflecting changes in autonomous factors.

The Bank introduced long-term repo OMOs (at market interest rates) in January as part of the reforms to its operations in the sterling money markets. Reflecting this, a significant proportion of the assets financing the banknote

issue is now accounted for by long-term reverse repos (Chart 28). Over the review period, yield tails in the monthly long-term repo OMOs remained small and each maturity was more than fully covered (Table B).

**Chart 28** Assets backing notes in circulation



(a) An advance to HM Government. This fluctuated prior to the transfer of responsibility for UK central government cash management to the UK Debt Management Office in April 2000. The Ways and Means is now usually constant, varying only very occasionally.

**Table B** Long-term repo operations

	Three month	Six month	Nine month	Twelve month
<b>19 September 2006</b>				
On offer (£ millions)	1,800	750	400	200
Cover	2.93	3.01	2.63	4.00
Weighted average rate <sup>(a)</sup>	4.892	5.014	5.115	5.190
Highest accepted rate <sup>(a)</sup>	4.900	5.015	5.115	5.190
Lowest accepted rate <sup>(a)</sup>	4.880	5.010	5.115	5.190
Tail <sup>(b)</sup> basis points	1.2	0.4	0	0
<b>17 October 2006</b>				
On offer (£ millions)	1,500	750	400	200
Cover	2.56	3.39	2.25	2.75
Weighted average rate <sup>(a)</sup>	4.973	5.063	5.145	5.215
Highest accepted rate <sup>(a)</sup>	4.975	5.072	5.145	5.215
Lowest accepted rate <sup>(a)</sup>	4.97	5.055	5.145	5.215
Tail <sup>(b)</sup> basis points	0.3	0.8	0	0
<b>14 November 2006</b>				
On offer (£ millions)	1,500	750	400	200
Cover	3.16	2.02	1.88	2.25
Weighted average rate <sup>(a)</sup>	5.073	5.152	5.205	5.245
Highest accepted rate <sup>(a)</sup>	5.075	5.165	5.205	5.245
Lowest accepted rate <sup>(a)</sup>	5.070	5.140	5.205	5.245
Tail <sup>(b)</sup> basis points	0.3	1.2	0	0

(a) Per cent.

(b) The yield tail measures the difference between the weighted average accepted rate and the lowest accepted rate.

- (1) The Bank sets the range at  $\pm 1\%$  of a reserves scheme member's cumulative balance throughout the entire maintenance period, thereby providing a range large enough to absorb likely errors in the Bank's liquidity forecast on the final day of the maintenance period.
- (2) This index squares the share of each counterparties' allocation, sums them, and divides by the total allocation. The higher the index, the greater the degree of concentration.
- (3) Autonomous factors are changes in sterling flows across the Bank's balance sheet and includes deposits/withdrawals from customer accounts and changes to note circulation.

## Collateral upgrade trades

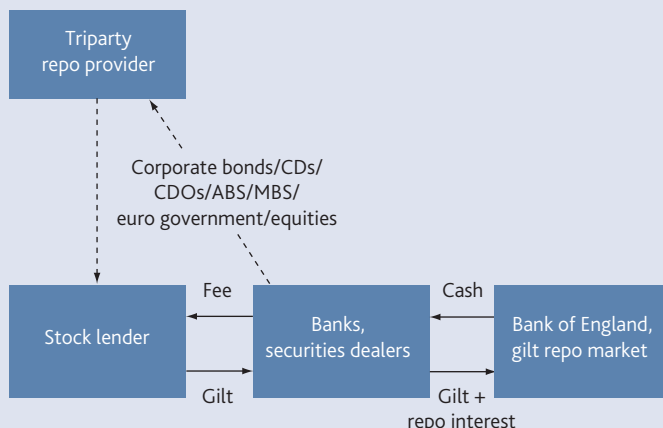
These trades involve using higher-yielding securities (such as non-government bonds or equities) to collateralise the borrowing of lower-yielding securities (such as government bonds) that can then be delivered against cash in the repo market in order to minimise funding costs. The general structure is shown in **Diagram A**. For dealers, there are two main benefits.

First, it is a cheaper way of financing their expanding inventories of non-government securities, including asset-backed securities, collateralised debt obligations (CDOs), corporate bonds and equities. Rather than financing such securities at Libor<sup>(1)</sup> (or above) by borrowing unsecured, they can borrow government bonds by paying a fee to a gilt lender and providing higher-yielding collateral, and then use the gilts to access cheaper funding in the repo market. Provided the combined cost of the repo interest rate and fee is less than Libor, the dealer obtains a funding advantage.

Second, the dealer is able to use a less liquid asset to borrow a more liquid asset (government bonds).

Gilt lenders, such as pension funds and insurance companies, are said to be increasingly willing to accept wider and lower-rated collateral, partly in search of higher fees, partly because some custodian banks acting as their lending agents will provide indemnities against the risk of borrower default and partly because triparty settlement services have made the processing of such transactions more straightforward.

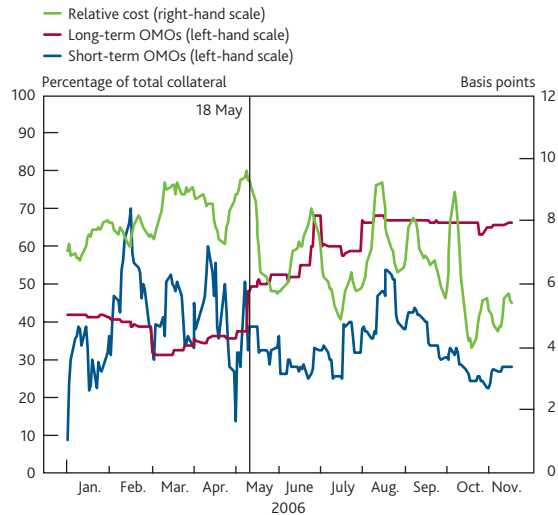
**Diagram A** Illustrative collateral upgrade trade



(1) Libor stands for the London interbank offered rate and is the rate of interest at which banks borrow funds, in marketable size, in the London interbank market.

The proportion of gilt collateral provided in the Bank's short-term repo operations increased slightly whereas in the long-term repo operations it was stable (**Chart 29**). One reason for the use of gilt collateral, reported by the Bank's contacts, is increased activity in so-called 'collateral upgrade' trades, as explained in the box opposite.

**Chart 29** Relative cost and use in OMOs of euro-denominated EEA government securities<sup>(a)</sup>



(a) Cost of euro-denominated collateral relative to sterling-denominated collateral relative to sterling-denominated collateral is calculated as the five-day moving average of the difference between the sterling and euro secured-unsecured (one-month) interest rate spread.

In July the Bank issued a consultation paper on its plans to provide longer-term finance to the banking system via outright purchases of bonds as part of its OMOs.<sup>(1)</sup> In the light of comments received on the consultation, on 24 November the Bank issued a Market Notice setting out the framework for bond purchases that it is minded to adopt.<sup>(2)</sup>

The Notice outlines proposals for the detailed mechanics of the Bank's planned purchases of both gilts and high-quality foreign currency government bonds (with the foreign currency cash flows swapped into fixed-rate sterling); for example, the number of bonds to be purchased in each tender, the size of tenders, and on what date and at what time the tenders should take place.

The Notice also sets out the criteria for selecting which foreign currency bonds the Bank will purchase outright as part of its OMOs: the Bank intends to purchase domestic-currency conventional bonds issued by AAA-rated sovereign issuers, with a minimum issue size of at least £4 billion, and where issuers' bonds contribute at least 2% of all bonds eligible for sale to the Bank. (Currently, this would permit the Bank to purchase bonds issued by the governments of Austria, Canada,

(1) See the box entitled 'Provision of longer-term financing through outright bond purchases' on page 288 of the 2006 Q3 *Quarterly Bulletin*.

(2) Available at [www.bankofengland.co.uk/markets/money/documentation/061124.pdf](http://www.bankofengland.co.uk/markets/money/documentation/061124.pdf).

Denmark, France, Germany, Netherlands, Spain and the United States.) The Bank intends that the bonds of all issuers eligible for outright purchase should in principle also be eligible to collateralise its OMO repo and swaps exposures, and will be exploring the practical consequences.

Feedback from the consultation also supported the proposed introduction of an electronic tender system for all OMOs (ie short and long-term repos as well as outright bond purchases). The Bank is planning to use SWIFTNet Browse to deliver the electronic tender system and is continuing to consult its counterparties on the design of the system.

In the light of feedback on the Notice and continuing dialogue with market participants, the Bank will issue, in due course, further detail and a proposed timetable for implementation.

### Foreign currency reserves

As part of the remit it was given by the Chancellor of the Exchequer in 1997, the Bank holds its own foreign exchange reserves. These assets, together with others used to facilitate participation in the euro area's TARGET payment system, have been financed by issuing foreign currency securities.

Under current arrangements, the Bank holds approximately €3½ billion of euro-denominated assets to facilitate the United Kingdom's participation in TARGET.

As detailed in the 2006 Q3 *Quarterly Bulletin*, the Bank will no longer participate as a direct member when the European System of Central Banks (ESCB) replaces TARGET with TARGET2.<sup>(1)</sup> The changes to TARGET arrangements mean that the Bank will eventually be able to hold fewer foreign currency assets, thereby reducing its need for foreign currency financing.

As previously reported, the Bank announced on 24 April 2006 that the euro bill issuance programme, which provided €3.6 billion of regular financing, would cease with immediate effect. The outstanding euro bills have been maturing over the previous six months and the final bill matured on 12 October 2006.

### Capital portfolio

As set out in previous *Quarterly Bulletins*, the Bank holds an investment portfolio. This portfolio is of approximately the same size as its capital and reserves (net of equity holdings, eg in the ECB and the BIS, and the Bank's physical assets, eg premises) and aggregate cash ratio deposits.

The portfolio is invested in gilts (currently around £2 billion) and other high-quality sterling-denominated debt securities (currently £1.1 billion). These investments are generally held to maturity. Over the current review period, gilt purchases were made in accordance with the published screen announcements: £37.6 million in September, £37.6 million in October and £37.6 million in November.

(1) The planned changes to the euro area's payment system, including the introduction (and membership) of TARGET2, are detailed on the ECB's website [www.ecb.int/paym/target/target2/html/index.en.html](http://www.ecb.int/paym/target/target2/html/index.en.html).



# Research and analysis



# The economic characteristics of immigrants and their impact on supply

By Jumana Saleheen and Chris Shadforth of the Bank's External MPC Unit.

Immigration to the United Kingdom has risen rapidly over the past decade, driven most recently by flows from the ten EU Accession countries. Monetary policy makers are interested in the impact of immigration on the macroeconomy and inflation. An increase in the number of immigrants, other things being equal, would raise the supply potential of the economy. But the extent to which potential supply increases will depend on the economic characteristics of immigrants. This article investigates the characteristics of immigrants, particularly new immigrants — those who have entered the United Kingdom in the past two years. It appears that new immigrants are more educated than both UK-born workers and previous immigrant waves, but are much more likely to be working in low-skilled occupations. The increasing share of new immigrants in low-skill, low-paid jobs seems to have led to the emergence of a gap between the wages of new immigrants and UK-born workers. The implications of these findings for overall productivity and the supply side of the economy are complex.

## Introduction

International migration to the United Kingdom is important because it may affect the labour market and wider economy. The Monetary Policy Committee needs to understand the likely impact of immigration on the balance between demand and supply in the economy in order to set interest rates appropriately. For example, if immigrants raise aggregate supply more than they raise aggregate demand then one would expect inflationary pressures to ease for a period of time.<sup>(1)</sup>

An increase in the number of immigrants, other things being equal, will raise the supply potential of the economy. But the extent to which potential supply increases will depend on the characteristics of immigrants relative to natives. The impact on the natural rate of unemployment will also depend on the characteristics of immigrants; in particular, it will fall if immigrants help to fill skill gaps. But the natural rate of unemployment might also fall if increased immigration or the threat of outsourcing to other countries results in domestic workers being prepared to work for lower wages than in the past.

The aim of this article is to investigate whether the characteristics of immigrants, particularly new immigrants, differ from those of the domestically born population. It asks three main questions:

- Where do immigrants come from?
- How skilled are immigrants?
- What are the employment, unemployment and wage rates of immigrants?

The article begins by setting out the channels through which immigrant characteristics can affect the supply side of the economy and then discusses the recent rise in immigration. The available data sources and their limitations are discussed in a box on pages 376–77. The article then moves on to answer the three main questions identified above and ends with some concluding comments.

## Immigrant characteristics and the supply potential of the economy

The characteristics of immigrants — in terms of their skills and preferences — can affect the level of sustainable output in the long run, and the aggregate growth rate of the economy in the medium run. There are three channels through which differences in characteristics might manifest themselves.

First, immigration of low-skilled (less productive) workers has the potential to lower the domestic rate of productivity growth temporarily. In the long run, if immigrants are less

(1) For more details see 'The macroeconomic impact of migration', a box in Bank of England (2006b).

skilled than the domestic population, then they will lower the overall level of productivity of the workforce, but they will not affect the rate of productivity growth or the rate of nominal wage growth consistent with the inflation target. The latter follows because, in equilibrium, nominal wages must grow in line with the sum of productivity growth and price inflation. However, the economy may experience a period of lower productivity growth if there is a prolonged period of rising net immigration of low-skilled workers (and *vice versa*). In other words, during this 'transition phase' the immigration of low-skilled workers can temporarily lower the rate of nominal wage growth that is consistent with the inflation target.

Second, if firms face skill shortages and immigrant labour helps to fill those skills gaps, there would be a fall in the imbalance between the pattern of labour demand and supply — in other words, lower 'mismatch'. A reduction in mismatch reduces the natural rate of unemployment<sup>(1)</sup> and therefore allows the actual unemployment rate to fall without a corresponding rise in inflation.

Third, the extent to which potential supply responds to an increase in immigration will depend on the characteristics of immigrants. If, for example, immigrants offer skills that are complementary to the existing workforce, this could encourage a larger share of the population to participate in the labour market and this will increase potential output even further. If immigrants were to reduce skill shortages or tended to work longer hours than UK-born workers, then they would tend to reduce rigidities and alter the link between the level of any excess demand in the economy and inflationary pressures.<sup>(2)</sup>

Apart from affecting the supply potential of the economy, immigrants also affect the level of aggregate demand. The balance between demand and supply is a key determinant of inflationary pressure, but this article does not seek to address the impact of immigration on demand in any detail.

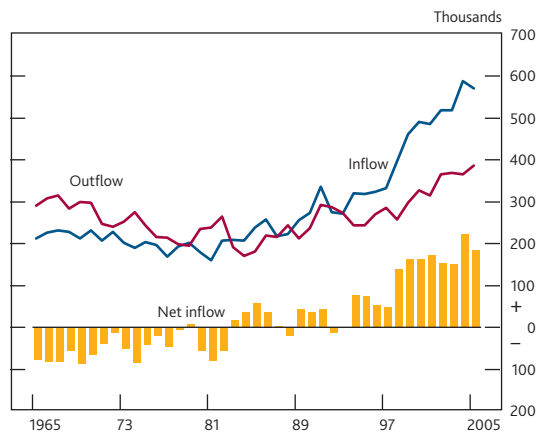
### The rise in immigration

Business contacts of the Bank of England's regional Agents and existing official data on immigration suggest that the availability of immigrant labour has been rising in the United Kingdom. Given the uncertainties surrounding the official statistics, these data can only be suggestive of the broad trends in immigration, rather than absolute levels. The box on pages 376–77 highlights the limitations and sources of bias of a number of different data sources.

Over the past decade, official estimates from the International Passenger Survey (IPS) suggest that there has been a rise in both the number of people coming to and leaving the United Kingdom (Chart 1). But the measured inflow has increased by more than the measured outflow, so that the net yearly inflow

of people to the United Kingdom has risen fourfold: from around 50,000 in 1996 to around 200,000 in both 2004 and 2005. At the same time, data from the Labour Force Survey (LFS) suggest that the share of foreign-born individuals in the UK population aged between 16 and 64 has risen sharply from around 8% in 1995 to around 11% in 2005 (Chart 2). Within this, the share of 'new' and 'recent' immigrants — defined as those who entered the United Kingdom in the past two or five years, respectively — has also increased. Before 1995, the share of foreign-born individuals in the population was broadly stable at around 8%.

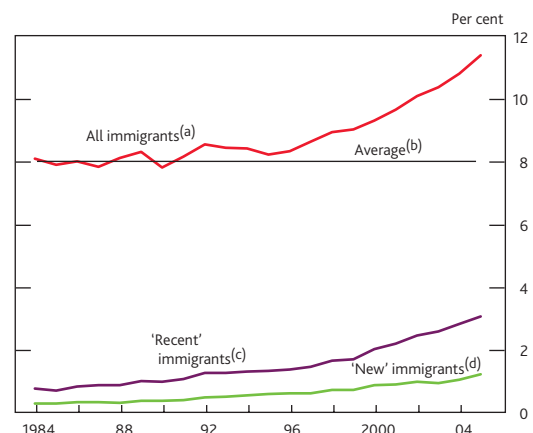
Chart 1 Immigration into and out of the United Kingdom<sup>(a)</sup>



Source: Data are mainly from the International Passenger Survey (IPS). From 1991, the ONS supplements the IPS with administrative data on asylum seekers and their dependents, and estimates of the migrant flow between the United Kingdom and the Republic of Ireland; the ONS also makes other adjustments to account for those whose intended length of stay changes (from less than a year to more than a year, and *vice versa*).

(a) The number of people (all ages) entering/leaving the United Kingdom with the intention of staying/leaving for at least one year.

Chart 2 The foreign-born share of the population aged 16 to 64



Source: Labour Force Survey (LFS).

- (a) The number of 16–64 year olds born outside the United Kingdom as a proportion of the total population aged 16–64.
- (b) Average share of foreign-born individuals in the UK population between 1985 and 1995.
- (c) 'Recent' immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.
- (d) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

(1) See Layard, Nickell and Jackman (1991).  
 (2) See King (2005a).

## Data sources and definitions

All estimates of immigration are highly uncertain. By their very nature, immigrant flows are unlikely to be accurately captured by any data source.<sup>(1)</sup> But knowing what the available data say — and the potential limitations of those data — is at least a natural starting point for policymakers who wish to understand the impact of immigration on the labour market and the wider economy.

### Data sources

Official estimates of net migration are primarily based on the International Passenger Survey (IPS), a survey of individuals passing through the main UK air and sea ports and the Channel Tunnel. The ONS supplements the IPS with administrative data on asylum seekers and their dependents, and estimates of the migrant flow between the United Kingdom and the Republic of Ireland; the ONS also makes other adjustments to account for those whose intended length of stay changes (see definitions below). The IPS questions 250,000 travellers annually. Of those, approximately 1% are migrant interviews. Headline IPS data are available for 2005, but more detailed statistics are only available for 2004 at present. In 2004, the IPS statistics were based on 2,801 people who entered the United Kingdom and 755 people who left. This is obviously a very small sample and is one reason why there are large uncertainties surrounding the official migration numbers. Other reasons why the IPS may mismeasure immigration are that: the survey was originally designed to capture tourism and business travel; and participation in the survey is voluntary and immigrants may be less likely to respond (perhaps because of language difficulties). Other sources of data on the gross inflow of immigrant workers include the Worker Registration Scheme (WRS), covering nationals solely from the A8<sup>(2)</sup> countries, and National Insurance Number (NINo) allocations to overseas nationals entering the United Kingdom.<sup>(3)</sup>

But because the focus of this article is on the characteristics of immigrants, how they have changed over time, and how they compare to UK-born workers, the most useful data source is the UK Labour Force Survey (LFS). The IPS, WRS and NINo data are, however, used to cross-check, wherever possible, the results obtained from the LFS data.

The LFS is a quarterly survey of households living at private addresses, student halls of residence and NHS accommodation in the United Kingdom, which provides a broad range of information on a large number of individuals. Throughout this article, the four LFS seasonal quarters are combined to produce annual data.<sup>(4)</sup> In 2005, the survey questioned over 300,000 individuals aged between 16 and 64, of whom 31,500 were born outside the United Kingdom (Table 1). Like any survey,

the LFS relies on additional information about the size and composition of the population — population weights — to produce an estimate of the 'true' immigrant population. In this respect, the accuracy of the LFS relies on the accuracy of the underlying population data (which in turn utilises the ONS estimates of the net migrant inflow). The accuracy of the survey will also depend on how representative the sample is of the population. For example, it might be the case that immigrants are less likely to respond to the LFS survey and so are underrepresented in the LFS data. Similarly, if immigrants, particularly temporary immigrants, are less likely to live at private addresses and more likely to live in communal establishments, such as guest houses or hotels, than the domestically born population, then the LFS data will not accurately reflect the size and characteristics of the immigrant population. Data from the 2001 Census suggest that immigrants are more likely than UK-born individuals to live in communal establishments. But just 1% of the total population (and 2% of the immigrant population) lived in communal establishments in 2001, suggesting that this is not a major source of bias.

Table 1 LFS sample size<sup>(a)</sup>

	2005 <sup>(b)</sup>		Immigrants			1995 <sup>(b)</sup>			
	All	UK born	Immigrants		Immigrants		New <sup>(d)</sup>		
			All	Recent <sup>(c)</sup>	All	Recent <sup>(c)</sup>			
Sample size (thousands)	305.1	273.6	31.5	8.1	3.1	29.5	4.4	1.8	
Population (millions)	38.1	33.8	4.3	1.1	0.4	3.0	0.5	0.2	
Immigrants (per cent of UK population)				11.3	3.0	1.1	8.2	1.3	0.5

Source: LFS.

(a) Based on individuals aged 16–64.

(b) Annual data reflect LFS seasonal quarters.

(c) 'Recent' immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.

(d) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

### Who is an immigrant?

When using LFS data in this article, an immigrant is defined as someone born outside the United Kingdom, but who now resides in the United Kingdom.<sup>(5)</sup> Considering foreign-born individuals in this way is informative about the stock of immigrants. With the recent increase in immigration following EU Accession, it is particularly interesting to look at recent changes in the stock of immigrants. In this vein, 'new' immigrants are defined as foreign-born individuals who arrived in the survey year or the preceding calendar year, and 'recent' immigrants are defined as foreign-born individuals who arrived in the survey year or at some time in the previous four (calendar) years. The reason for considering 'new' immigrants separately from the stock of foreign-born immigrants is that they may be different in important ways from those who

arrived earlier.<sup>(6)</sup> **Table 1** shows that the LFS sample for 'new' immigrants in 2005 is small, around 3,000 individuals, so it is useful to see if the qualitative patterns observed for new immigrants is borne out by the larger sample (8,000 individuals) of 'recent' immigrants.

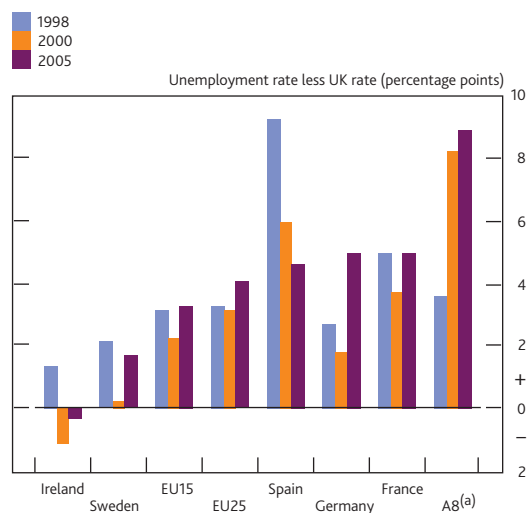
It would be preferable to employ the same definition of an immigrant in the LFS and the IPS data, but unfortunately that is not possible. Instead the IPS provides aggregated data consistent with the UN-recommended definition of an international (long-term) migrant; that is, a migrant is someone who changes his or her country of usual residence for a period of at least a year, so that the country of destination effectively becomes the country of usual residence. In other words, individuals surveyed by the IPS are classified as a migrant if they report an intention to stay in the United Kingdom for a year or more. However, intentions may or may

not be realised: those entering the country as a short-term 'visitor', may later decide to remain in the United Kingdom for longer than a year, and *vice versa*. To account for such changes in intentions (and therefore migratory status) the ONS makes adjustments to the IPS numbers.<sup>(7)</sup>

- (1) See King (2005b).
- (2) Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.
- (3) For more details on the uncertainties with these and other data sources see Bank of England (2006b) pages 22 and 23 and the box on 'International migration data', in Bank of England (2005).
- (4) Prior to 2006, the ONS collated LFS data by seasonal quarters. For example, in this article the year 2005 embodies LFS data from 2005 Q1 (March-May) to 2005 Q4 (December 2005-February 2006).
- (5) This definition is widely used by others, for example, Borjas (2005), Card (2005) and Dustmann *et al* (2005).
- (6) See Borjas (1985) for a discussion on differences in the profile across waves of immigrants to the United States.
- (7) For more details, see Office for National Statistics (2006), Appendices A and B.

Several factors might explain the dramatic rise in immigration over the past decade. First, much of the most recent increase in immigration is likely to have been driven by the expansion of the European Union (EU) on 1 May 2004, to include ten new central and eastern European countries. The ten EU Accession countries were: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Cyprus and Malta. An important distinction is often made between the first eight countries and the last two, as citizens from Cyprus and Malta had already enjoyed relatively free access to the UK labour market prior to EU expansion. Citizens from the first eight countries, referred to as the A8, only obtained free movement and the right to work in the United Kingdom, Sweden and Ireland from 1 May 2004. Finland, Greece, Portugal and Spain opened their labour markets to these workers on 1 May 2006,

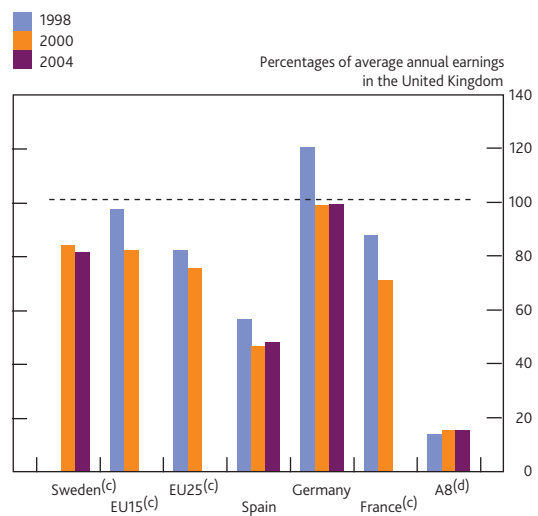
**Chart 3** European unemployment rates relative to the United Kingdom



Source: Eurostat.

(a) Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

**Chart 4** European gross average annual earnings relative to the United Kingdom<sup>(a)(b)</sup>



Source: Eurostat.

- (a) Average annual gross earnings in industry and services (of full-time employees in companies with ten or more employees). Data are at current prices, based on purchasing power parity.
- (b) Latest available data are for 2004.
- (c) Missing bars occur because of a lack of data.
- (d) A8 data are weighted averages of earnings in Hungary, Poland and Slovakia in each period. Data are not available for the other A8 countries.

while Italy followed in late July 2006. The remaining EU member states (including Germany, France and Austria) chose to retain restrictions on immigration from the A8 countries for up to seven years. Prior to accession, unemployment in the A8 economies was higher, and earnings lower, than in many EU countries, especially the United Kingdom (**Charts 3 and 4**). So it seems likely that at least some of the inflow of immigrants to the United Kingdom from the A8 since accession reflects pent-up labour supply that has been released with the removal of restrictions on labour movement.

Second, because the bulk of the rise in net migration predates EU expansion in 2004 (**Chart 1**), it seems likely that immigration has grown rapidly since the mid-1990s in part because of the United Kingdom's low level of unemployment and higher earnings (**Charts 3 and 4**). Over this period, immigrants are therefore likely to have been attracted to the United Kingdom by the relative strength of its labour market, both in terms of higher relative wages and favourable cyclical position.

Finally, since 2002, the United Kingdom has adopted a more flexible and open approach to attracting highly skilled immigrants and immigrants to fill particular skill shortages. Potential immigrants from outside the EU are given points according to their qualifications. Individuals who accumulate a number of points beyond a certain threshold become eligible for a work permit. The Government has also introduced a sector-based work permit scheme to attract immigrants to fill particular skill shortages.

The expansion of the EU is set to continue, with Bulgaria and Romania due to join on 1 January 2007. The UK Government has, however, announced some restrictions on the extent to which these citizens may enter the UK labour market.<sup>(1)</sup> There are also EU 'candidate countries' and 'potential candidate countries' who may at some stage accede to the EU.<sup>(2)</sup> The opening up of the UK labour market to nationals of an expanded EU therefore not only represents a long-term structural change to the UK labour market, but is likely to be a continuing influence as the EU expands further in the years to come.

In summary, the increase in net migration over the past decade is likely to reflect an endogenous response to both the higher level of wages and the cyclical position of the UK economy, as well as UK immigration policy.

## Where do immigrants to the United Kingdom come from?

The LFS data suggest that around 11% of the working-age UK population were foreign born in 2005. Within that, around one fifth were born in EU countries, one fifth in the Indian subcontinent and a quarter in Africa or the Middle East (**Table A**). Those born in the A8 countries made up a small fraction of the stock of immigrants in 2005, but they are the biggest group in those defined as 'new' immigrants. In other words, while A8-born individuals represented a small proportion of immigrants before 2004, the share of A8-born individuals has been much greater among immigrants who arrived in the past two years. In particular, according to the LFS, A8 immigrants account for one in four of new arrivals since 2004, but only one in twenty of the total stock of immigrants. **Table A** also shows that the share of 'new'

immigrants has grown by 0.63 percentage points between 1995 and 2005, with those born in the A8 accounting for nearly half (0.26 percentage points) of the increase. The share of 'new' immigrants born in Africa and the Indian subcontinent has risen strongly as well.<sup>(3)</sup> Overall it appears that 'new' immigrants are much more likely to come from A8 countries than previous immigrant waves, though other countries remain important. That is very much as one would probably expect.

**Table A** Share of immigrants in the population: by country of birth<sup>(a)(b)</sup>

	All migrants			New migrants <sup>(c)</sup>		
	2005	1995	Change (percentage points)	2005	1995	Change (percentage points)
Per cent of population	11.32	8.16	3.16	1.15	0.52	0.63
of which:						
A8 <sup>(d)</sup>	0.59	0.10	0.49	0.28	0.02	0.26
Africa and Middle East	2.79	1.64	1.15	0.22	0.10	0.12
Indian subcontinent	2.40	1.85	0.55	0.16	0.06	0.11
EU14	2.16	2.23	-0.07	0.16	0.14	0.02
Americas	1.18	1.00	0.18	0.11	0.07	0.03
Rest of Asia	1.05	0.63	0.42	0.09	0.07	0.03
Rest of Europe <sup>(e)</sup>	0.77	0.46	0.31	0.06	0.04	0.02
Australia and New Zealand	0.38	0.24	0.14	0.06	0.03	0.03

Source: LFS.

(a) Based on individuals aged 16–64.

(b) Annual data reflect LFS seasonal quarters. See the box for more details.

(c) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

(d) Country of birth data by all A8 countries are only available from 1998. For 1995, Czechoslovakia, Hungary and Poland (which account for 80% of A8 immigrants) are used to proxy the A8.

(e) Rest of Europe includes countries not in the EU15 and A8.

Whether or not these 'new' immigrants intend to remain in the United Kingdom permanently is likely to be a key determinant of how much of their income they spend locally, and thereby how much they boost aggregate demand in the United Kingdom. There are few reliable data on the length of time immigrants stay in the United Kingdom. IPS data give a partial read on the length of time immigrants intend to stay in the United Kingdom, but this is not a reliable metric because intentions may change after arrival. The IPS definition of a migrant is someone who intends to stay in the United Kingdom for at least one year (see the box on pages 376–77). Of this group of immigrants, the data suggest that the majority intend to stay in the country for at most four years. If this is broadly true, one might expect the impact on aggregate demand to be more limited than if immigrants intend to stay for longer. That is because temporary immigrants may be less

(1) The press release from October 2006 is available at: [www.ind.homeoffice.gov.uk/aboutus/newsarchive/controlledaccessstouklabourmarket](http://www.ind.homeoffice.gov.uk/aboutus/newsarchive/controlledaccessstouklabourmarket).

(2) Croatia, the Former Yugoslav Republic of Macedonia and Turkey are classified as 'candidate countries'. Albania, Bosnia and Herzegovina, Serbia, Montenegro and Kosovo, are classified as 'potential candidate countries'.

(3) Immigrants from these other countries will normally require work permits to enter the United Kingdom. Salt and Millar (2006), show that the trends observed in the LFS data are consistent with the work permits data. The broad trends for 'new' immigrants are also consistent with the IPS data.

willing to incur the full costs of setting up home; for example, they may purchase fewer durable goods. But permanent settlement may be encouraged by the presence of large immigrant communities, since a network of friends or family would be expected to raise the quality of life of 'new' immigrants and may ease adjustment to living in a new country.

### How skilled are immigrants?

The skills of immigrants relative to domestically born individuals are important in determining the implications for wages in the economy. One way to proxy skills is by education (Table B), while another is by occupation.

**Table B** Educational attainment: immigrants and those born in the United Kingdom<sup>(a)(b)</sup>

	2005				1995			
	All	UK born	Immigrants		All	UK born	Immigrants	
			All	Recent <sup>(c)</sup>			New <sup>(d)</sup>	All
<b>By age left full-time education (per cent)</b>								
<16 years (incomplete schooling)	17	17	12	7	6	21	9	6
16–20 years (completed secondary school)	65	66	52	48	49	52	47	41
21+ years (completed a degree)	19	17	36	45	45	26	44	53
<b>By highest qualification (per cent)</b>								
Degree	26	26	27	20	17	22	11	10
A-level or equivalent	24	26	13	8	6	15	9	8
Up to GCSE or equivalent	28	30	11	3	2	13	4	2
Other	8	5	31	53	59	28	62	70
None	14	13	18	15	16	23	14	11
<b>Average age</b>	<b>39.7</b>	<b>39.9</b>	<b>38.4</b>	<b>30.2</b>	<b>29.0</b>	<b>39.4</b>	<b>29.7</b>	<b>28.9</b>

Source: LFS.

(a) Based on individuals aged 16–64.  
 (b) Annual data reflect LFS seasonal quarters. See the box for more details.  
 (c) 'Recent' immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.  
 (d) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

The LFS records the highest qualification of individuals. One can divide these qualifications into: Degree, A-levels (or equivalent) and up to GCSE (or equivalent), Other, and None. Little information is available on the types of qualifications that are assigned to 'Other' qualifications. But Table B shows that nearly 60% of 'new' immigrants were allocated to this category in 2005. The ONS's policy for coding any foreign qualification not on the list of (mainly UK-specific) qualifications is to code them as 'Other'. One example of this is the International Baccalaureate. This is roughly equivalent to an A-level, but was only explicitly introduced into the LFS in 2005 — prior to that it was coded as 'Other'. So the LFS definitions are not very useful for assessing the relative qualifications of immigrants.<sup>(1)</sup>

However, it is also possible to look at the amount of time spent in education. The LFS asks individuals the age at which they completed full-time education. In the United Kingdom, the minimum age for leaving school is 16, and the standard age for graduating with a degree is 21. The timings are likely to be different in other countries. But based on these data, people who left full-time education before 16 are classified in this article as having incomplete schooling, and those who left after age 21 as having completed a degree. This leaves individuals who left full-time education between the ages of 16 and 20 — who are classified as having completed secondary school.

The above groupings will not be entirely accurate because they will misclassify individuals who go through school faster or slower than the average person. They will also fail to capture those who take time out of full-time education (for example to work or travel) and those who continue further education on a part-time basis. But if this inaccuracy affects both immigrants and UK-born workers in a similar way, then the groupings should still provide a useful guide to the relative skills of immigrants. Using these definitions, 66% of the UK-born population have only completed secondary school while 17% have a degree (Table B). A smaller fraction (52%) of immigrants have only secondary school qualifications and a greater fraction (36%) have degrees. An even higher proportion of 'new' immigrants (45%) have degrees. So, on the basis of the age at which individuals left full-time education, immigrants, especially 'new' immigrants, generally appear to be more skilled than those born in the United Kingdom.

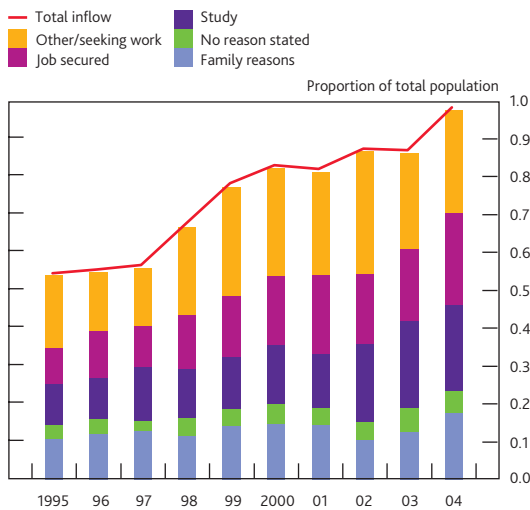
Table B shows that the average immigrant in the United Kingdom is 38 years old, compared to nearly 40 for the UK-born population. In fact, both IPS and LFS data show that over 90% of immigrants are aged between 15 and 44. 'Recent' immigrants and 'new' immigrants are younger, with average ages of 30 and 29 respectively, suggesting that they have fewer years of work experience.

### What are the employment, unemployment and wage rates of immigrants?

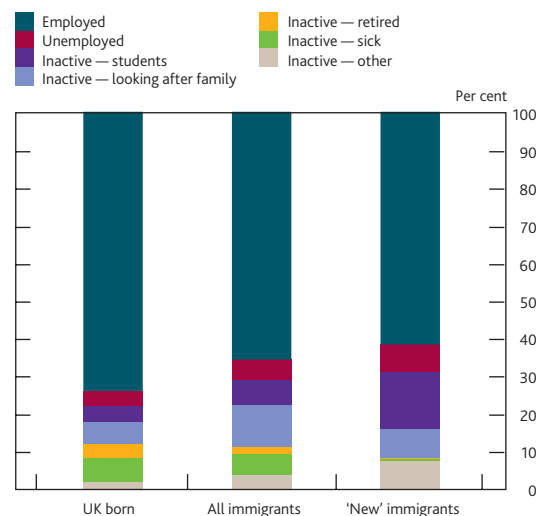
Chart 5 shows the estimated gross inflow of immigrants to the United Kingdom by reason, available from the IPS data. It shows that increasing shares of the population have entered the United Kingdom as job holders, students, and for 'other' — this last category includes job seekers.<sup>(2)</sup>

Chart 6 and Table C show that most immigrants are employed. They also show that compared with UK-born

(1) Interestingly, the Census 2001, filled out by individuals themselves, does not suffer from this same problem. See Manacorda, Manning and Wadsworth (2006), Table A4.  
 (2) Splitting 'new' immigration from the LFS into students, employed and unemployed shows a similar picture.

**Chart 5 Reason for migrating to the United Kingdom**

Source: ONS; data are mainly from the International Passenger Survey (IPS). The ONS supplements the IPS with administrative data on asylum seekers and their dependents, and estimates of the migrant flow between the United Kingdom and the Republic of Ireland; the ONS also makes other adjustments to account for those whose intended length of stay changes (from less than one year to more than one year, and vice versa). The IPS sampling methodology changed in 1999.

**Chart 6 Type of economic activity in 2005: UK born and immigrants(a)(b)(c)**

Source: LFS.

- (a) Based on individuals aged 16–64.  
 (b) Annual data reflect LFS seasonal quarters. See the box for more details.  
 (c) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

workers, immigrants (on the LFS foreign-born definition) are on average somewhat less likely to be employed and somewhat more likely to be inactive or unemployed.<sup>(1)</sup> Individuals who are inactive in the labour market include a varied group of people such as students, retired workers, those who are sick or looking after their family, and those who do not want work. **Chart 6** shows that sickness is an important reason for inactivity among UK-born workers and the stock of immigrants — but it is virtually zero for 'new' immigrants. 'New' immigrants are inactive primarily because they are students or looking after family. According to LFS data, of the remaining inactive 'new' immigrants — labelled as 'other' in **Chart 6** — most of them do not (or are not eligible to) claim

**Table C Labour market outcomes: immigrants and those born in the United Kingdom(a)(b)**

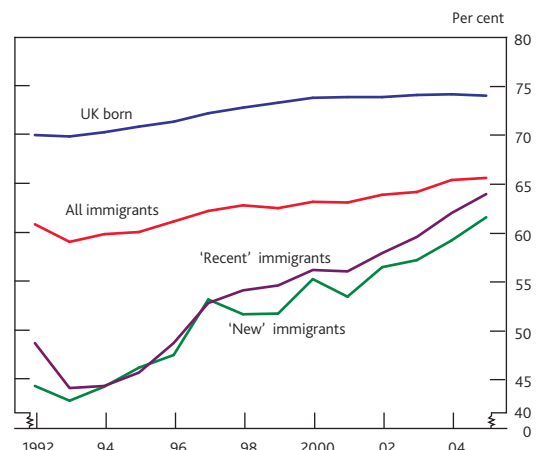
	2005					1995		
	All	UK born	Immigrants			Immigrants		
			All	Recent <sup>(c)</sup>	New <sup>(d)</sup>	All	Recent <sup>(c)</sup>	New <sup>(d)</sup>
Employment rate (per cent of population)	72.8	73.7	65.4	63.7	61.3	59.8	45.5	46.0
Inactivity rate (per cent of population)	23.4	22.7	29.4	30.0	31.4	31.6	44.3	45.8
Unemployment rate (per cent of workforce)	5.0	4.7	7.4	8.9	10.6	12.5	18.3	15.1
Average basic hours worked per week	34.7	34.6	36.1	36.4	36.8	36.7	36.4	36.2
Average paid overtime hours per week	3.0	3.0	3.2	4.3	4.8	3.6	3.8	4.4

Source: LFS.

- (a) Based on individuals aged 16–64.  
 (b) Annual data reflect LFS seasonal quarters. See the box for more details.  
 (c) 'Recent' immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.  
 (d) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

any form of benefits,<sup>(2)</sup> and over half of them are inactive because they do not want a job.

**Chart 7** shows how the employment rates of UK-born workers and new immigrants have evolved over time. The LFS data suggest that 74% of UK-born individuals were employed compared with 65% of all immigrants in 2005 (**Table C**). Since 1995, 'recent' and 'new' immigrants have had lower employment rates than immigrants in general, though the gap between the groups has narrowed substantially. When employed, the average immigrant worked 1½ hours per week

**Chart 7 Employment rates(a)**

Source: LFS.

- (a) Defined as the total number of 16–64 year olds in employment in each category as a fraction of the population aged 16–64 in each category.

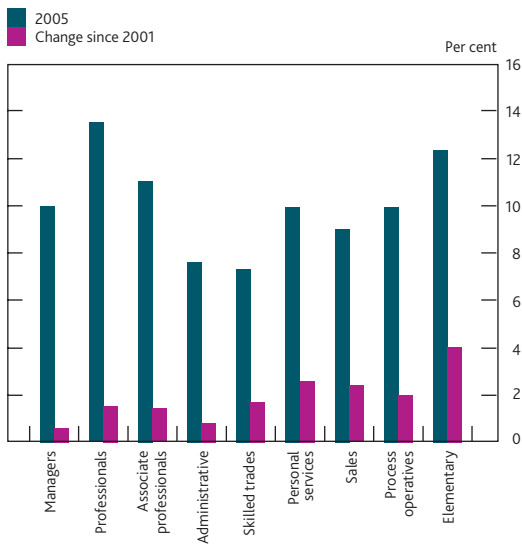
- (1) The impact of A8 migration on unemployment is examined by Gilpin *et al* (2006).  
 (2) For example, many non-EU citizens are ineligible to claim benefits in the United Kingdom and A8 citizens are only entitled to claim unemployment benefit if they have previously been in employment in the United Kingdom for twelve months.



more in 2005 than the average individual born in the United Kingdom.<sup>(1)</sup>

**Chart 8** shows the share of total employment in each occupation accounted for by foreign-born workers. According to the data, about 10% of all ‘Managers’ in the United Kingdom were foreign born in 2005. The chart shows a U-shaped profile, where there is a greater share of immigrants at both ends of the occupational distribution than in the middle. The pink bars plot these shares of immigrants since 2001. It shows that the immigrant share has increased in all occupations, but by proportionally more in lower-skilled jobs. The bottom two occupational groups are ‘Process operatives’ — including food and textile operatives — and ‘Elementary’ — including cleaners, shelf fillers, packers, labourers and kitchen and catering assistants.

**Chart 8** Share of total employment in each occupation accounted for by immigrants<sup>(a)(b)</sup>

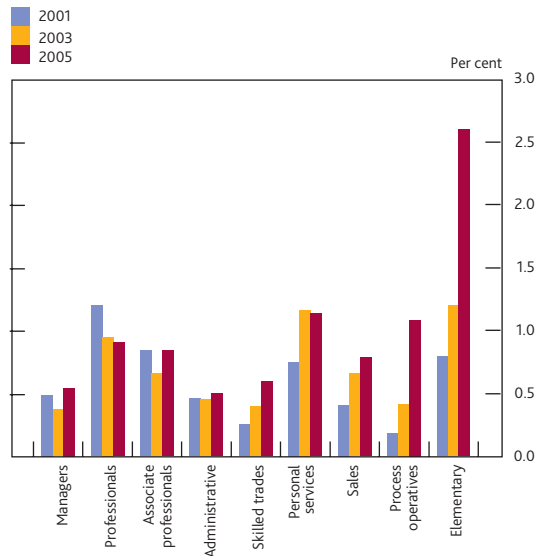


Source: LFS.

- (a) Based on all employed individuals aged 16–64.
- (b) The number of all foreign-born workers in each occupation as a percentage of the total number of people employed in that occupation.

**Chart 9** shows a similar picture for ‘new’ immigrants. The first set of bars shows that in 2005, only half a per cent of all UK ‘Managers’ were ‘new’ immigrants; this share has not changed much since 2001. By contrast, 2½% of all individuals employed in ‘Elementary occupations’ in 2005 were ‘new’ immigrants, compared with 0.8% in 2001.<sup>(2)</sup> The fraction of ‘new’ immigrants has grown fastest in Elementary occupations and among Process operatives. **Chart 10** shows that these jobs are also lower-paid jobs. In other words, despite apparently being relatively well-educated, ‘new’ immigrants are overrepresented in low-skill, low-paid jobs. The fact that ‘new’ immigrants are concentrated in low-skilled occupations is in line with evidence from the Worker Registration Scheme (WRS) data.<sup>(3)</sup> This finding is also consistent with what businesses have been telling the Bank’s regional Agents. It is, however, possible that over time these immigrants will

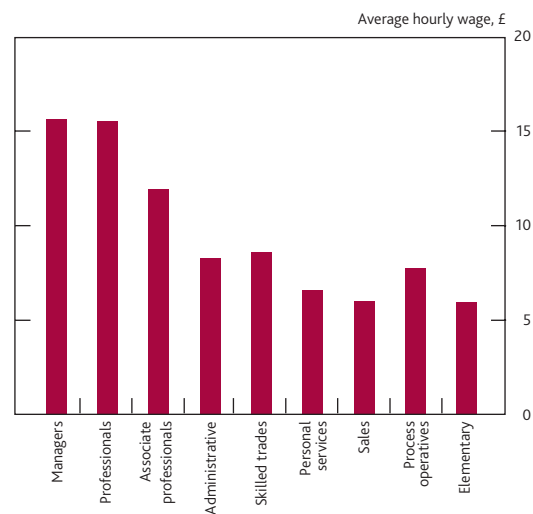
**Chart 9** Share of total employment in each occupation accounted for by ‘new’ immigrants<sup>(a)(b)(c)</sup>



Source: LFS.

- (a) ‘New’ immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.
- (b) Based on all employed individuals aged 16–64.
- (c) The number of ‘new’ immigrants in each occupation as a percentage of the total number of people employed in that occupation.

**Chart 10** Hourly wage<sup>(a)</sup> in 2005: by occupation<sup>(b)</sup>



Source: LFS.

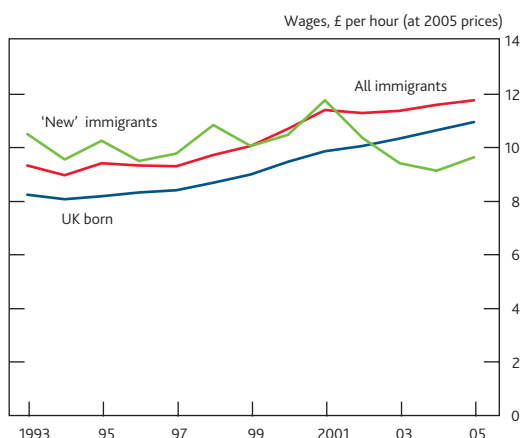
- (a) The average hourly wage of all employed individuals (both UK and foreign-born) in each occupation in 2005.
- (b) Based on all employed individuals aged 16–64.

develop the English language skills and knowledge of the local labour market that may enable them to move to higher-paid jobs that are better matched to their educational skills.<sup>(4)</sup>

- (1) This differential in hours is driven by women: immigrant women on average work 2.4 hours more a week than UK-born women. Even after one controls for demographics and job characteristics, immigrants still work longer hours than UK-born workers.
- (2) Those individuals defined as ‘new’ immigrants in 2001 that are still working will not be captured as ‘new’ immigrants in 2005.
- (3) See Home Office (2006), *Accession Monitoring Report*, May 2004–September 2006, page 15.
- (4) See for example, Eckstein and Weiss (2004).

Chart 11 shows that, according to LFS data, immigrants have on average earned more than UK-born individuals since 1993. This result is partly explained by the fact that immigrants have been more likely to live in London, where hourly wage rates are higher than the rest of the country. The chart also shows that average hourly pay of 'new' immigrants was not very different to existing immigrants through the 1990s. But since 2002, the real wages of 'new' immigrants have fallen relative to the real wages of those born in the United Kingdom. What has driven this fall? Part of it arises because 'new' immigrants are

Chart 11 Average hourly wage<sup>(a)(b)</sup>



Sources: LFS and ONS.

- (a) Based on employees aged 16–64 who report their wage. This chart excludes those earning above £100 per hour or less than £1 an hour to avoid the analysis being influenced by such extreme observations.
- (b) Wages are adjusted using CPI, relative to a 2005 base.

increasingly taking up low-paid jobs: Table D shows that there are more 'new' immigrants (16%) earning less than £5 per hour than UK-born workers (10%). But part of it reflects the fact that 'new' immigrants are increasingly settling outside London, where wages are on average lower. Chart 12 shows

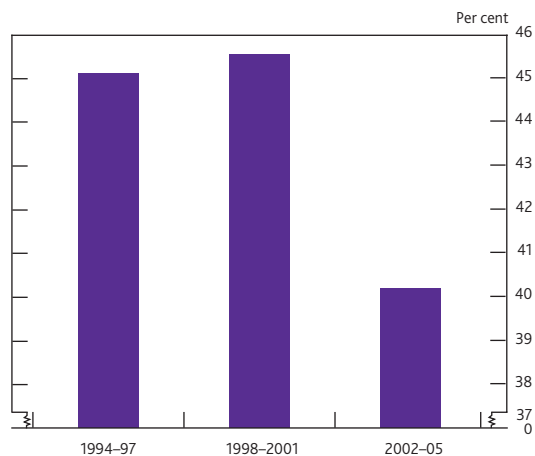
Table D Hourly wages: immigrants and those born in the United Kingdom<sup>(a)(b)</sup>

	2005				1995			
	All	UK born	Immigrants		Immigrants			
			All	Recent <sup>(c)</sup>	New <sup>(d)</sup>	All	Recent <sup>(c)</sup>	New <sup>(d)</sup>
Average wages per hour (£ at 2005 prices) <sup>(e)</sup>	10.9	10.8	11.6	10.0	9.5	9.3	10.5	10.2
<b>Distribution of workers (per cent)</b>								
<i>£ per hour (at 2005 prices)<sup>(e)</sup></i>								
<£5.00	10	10	9	13	16	27	34	34
£5.00–£9.99	48	48	45	52	54	41	28	27
£10.00–£14.99	23	23	22	18	15	18	18	20
>£15.00	20	19	23	17	15	13	20	18

Source: LFS.

- (a) Based on individuals aged 16–64. Those earning above £100 an hour or less than £1 an hour are considered to be extreme outliers and are excluded.
- (b) Annual data reflect LFS seasonal quarters. See the box for more details.
- (c) 'Recent' immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.
- (d) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.
- (e) Wages are adjusted using CPI, relative to a 2005 base.

Chart 12 Proportion of 'new' immigrants that settle in London<sup>(a)(b)(c)</sup>



Source: LFS.

- (a) Based on individuals aged 16–64.
- (b) 'New' immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.
- (c) The number of 'new' immigrants living in London as a percentage of the total number of 'new' immigrants.

that between 2002 and 2005, 40% of all 'new' immigrants settled in London, down from more than 45% between 1994 and 2001.<sup>(1)</sup>

What impact does such a wage gap have on aggregate nominal wages? If there is an increase in labour supply from 'new' immigrants, and they tend to work in low-paid jobs then, other things being equal, this will lower average wages. A simple metric of this compositional or 'batting average' effect, based on the difference in average wage rates and employment shares, suggests that it has lowered the level of aggregate nominal wages by around a quarter of a per cent over the past two years. This would lower aggregate nominal wage growth temporarily. The weakness in nominal wage growth can be interpreted in one of three ways.

First, workers pay may accurately reflect their productivity. Under this scenario, the temporary fall in aggregate nominal wage growth would be interpreted as capturing a fall in aggregate productivity growth. That should mean that there is no impact on unit labour costs or inflationary pressures and therefore no implications for monetary policy. This interpretation would suggest that the observed weakness in nominal wage growth may not be as much of an indication of weakness in the labour market as it would have been in the past, because immigration has temporarily lowered the rate of nominal wage growth consistent with the inflation target.

Second, the new immigrants may have displaced similar, or even less productive, workers. In this scenario the effects on

(1) National Insurance Number (NINo) allocations also show that while London remained the most likely destination for immigrants, the proportion residing in London has fallen in recent years. For more details see Department for Work and Pensions (2006).

aggregate productivity could be less pronounced, or even positive. The weakness in aggregate nominal wage growth then feeds through to weaker growth in unit labour costs and reduced inflationary pressures.

Finally, the weakness in nominal wage growth may be a reflection of improvements on the supply side of the economy, in particular a lower natural rate of unemployment. This could arise through two channels. First, immigration may have helped to fill skill gaps. Contacts of the Bank’s regional Agents have reported that the increased recruitment of migrant workers has been prompted by skill shortages. It seems likely that, without the influx of ‘new’ immigrants to fill these skill gaps, earnings would have risen at a faster rate, putting upward pressure on the costs of employers and, ultimately, inflation.<sup>(1)</sup> Second, the increased international mobility of labour and the threat of outsourcing to other countries may have altered the wage-setting process by increasing the competitive pressures on domestic workers.<sup>(2)</sup> As a result, domestic workers may be willing to work for lower wages than in the past.

In summary, the impact of immigration on nominal wage growth, productivity and the supply side of the economy is complex.

Table E shows that the share of immigrants varies considerably by industrial sector. For example, the immigrant share is highest in the Hotels and restaurants sector, a relatively low-paid sector. The industry with the second highest immigrant share is Finance, real estate and business activities, a relatively high-paid sector. Of those reported here, the

immigrant shares are lowest in Agriculture and Construction. However, contacts of the Bank’s regional Agents suggest that the immigrant share is relatively high in Agriculture.<sup>(3)</sup> This divergence is likely to reflect the fact that immigrant workers in the Agricultural sector are more likely to be temporary seasonal workers who are likely to be underrepresented in the LFS survey. The data by industry echo the data by occupation in that new immigrants are overrepresented in relatively low-paid sectors.

## Conclusion

The data on immigration to the United Kingdom are subject to considerable measurement error. But knowing what the available data say is at least a natural starting point for policymakers who wish to understand the impact of immigration on the labour market and the wider economy.

The available data suggest that most immigrants are employed. They also suggest that the characteristics of immigrants and those born in the United Kingdom are somewhat different. Importantly, immigrants to the United Kingdom (regardless of how long they have been in the country) are overrepresented in both high-paid occupations (Managers and Professionals) and low-paid occupations (Elementary). They are also overrepresented in both high-paid industries (Finance, real estate and business activities) and low-paid industries (Hotels and restaurants). Immigrants also tend to be younger, better educated and work longer hours than those born in the United Kingdom.

It appears that ‘new’ immigrants (those who entered the United Kingdom up to two years ago) are more educated than both previous waves of immigrants and those born in the United Kingdom, but they are more likely to be working in Elementary occupations.

Will these recent trends continue? Although the data show that ‘new’ immigrants are overrepresented in low-paid jobs, they appear, on average, to be relatively well-educated. So they may move into better paid jobs over time, or leave to return to their homeland. On the other hand, a new wave of immigrants may replace the current inflow. There is a lot of uncertainty in this area, which makes monitoring developments all the more important.

What are the implications of these findings for productivity and the supply side of the economy? The increasing share of ‘new’ immigrants in low-paid jobs appears to have led to the emergence of a striking wage gap between ‘new’ immigrants and UK-born workers. One possibility is that the lower pay of

**Table E** Share of total employment in each industry accounted for by immigrants<sup>(a)(b)</sup>

Per cent	2005			1995		
	Immigrants			Immigrants		
	All	Recent <sup>(c)</sup>	New <sup>(d)</sup>	All	Recent <sup>(c)</sup>	New <sup>(d)</sup>
<b>By industry<sup>(e)</sup></b>						
Hotels and restaurants	19.7	6.9	2.8	13.8	2.5	1.0
Finance, real estate and business activities	12.1	2.8	1.0	7.5	1.1	0.4
Transport and communications	11.8	2.4	0.9	7.0	0.6	0.2
Public sector	10.1	2.4	0.7	7.8	0.7	0.3
Wholesale, retail and repairs	8.8	2.1	0.7	6.0	0.5	0.2
Mining and quarrying	6.7	1.8	0.2	5.5	1.2	0.7
Construction	6.0	1.7	0.6	4.3	0.2	0.1
Agriculture	4.3	1.3	0.5	2.9	0.4	0.1
Immigrants <sup>(f)</sup>	11.3	3.0	1.1	8.2	1.3	0.5

Source: LFS.

(a) Based on all employed individuals aged 16–64.

(b) Annual data reflect LFS seasonal quarters. See the box for more details.

(c) ‘Recent’ immigrants are those who entered the United Kingdom in the survey year or at some time in the previous four (calendar) years.

(d) ‘New’ immigrants are those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

(e) The number of foreign-born workers in each industry as a percentage of the total number of people employed in that industry.

(f) The number of foreign-born individuals as a proportion of the total UK population.

(1) See King (2005a, 2005b).

(2) See Bean (2006).

(3) For more details see Bank of England (2006a).

'new' immigrants reflects lower productivity, in which case aggregate productivity growth would fall temporarily. An alternative possibility is that the new immigrants may have displaced similar or less productive workers. In this case, the effects on aggregate productivity could be less pronounced, or even positive.

Immigration may also have increased the supply potential of the economy by lowering the natural rate of unemployment; either by reducing skills gaps in a tight labour market or by tempering the wage demands of domestic workers, or both.

These different possibilities and the difficulty of quantifying the impact of immigration on wages, productivity and the natural rate of unemployment, demonstrate that the implications for overall productivity and the supply side of the economy are complex. And, of course, the overall impact on inflation is determined by the extent to which immigration affects the balance between supply and demand in the economy.

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# Recent developments in sterling inflation-linked markets

By Grellan McGrath and Robin Windle of the Bank's Sterling Markets Division.

Sterling inflation-linked markets have developed rapidly over recent years, both in size and complexity. These changes have been driven by increased demand, especially from institutional investors such as pension funds, which has stimulated new supply as well as the rapid development of the market for inflation swaps. This article surveys these developments and considers their implications, in particular for the way risk is transferred between market participants and the interpretation of observed market rates. Market contacts suggest the increases in activity and the number of participants have enhanced efficiency in these markets, although the timing of demand and supply flows can still influence observed market prices. Looking ahead, there are considerable uncertainties as to the size of future demand and supply in the market.

## Introduction

In recent years, the market for sterling inflation-linked instruments has developed substantially. Demand for inflation-linked cash flows has increased from institutional investors, such as pension funds. And the rapid development of the market for inflation swaps has resulted in additional ways in which inflation-linked products are structured. At the same time, there has been a significant increase in the supply of inflation-linked assets. Supply comes from both the UK government, which issues index-linked gilts, and non-government sources. The latter are primarily companies which issue corporate inflation-linked bonds and/or pay the inflation-linked legs of swaps.<sup>(1)</sup>

The development of new structures to accommodate supply and demand in the inflation-linked market means that inflation risk is being transferred more frequently. From a financial stability standpoint it is useful to gauge the sustainability of these new developments. And given the large role played by UK financial intermediaries in the market, it is also important to understand where the exposure to risk, inflation or otherwise, ultimately lies.

The Monetary Policy Committee (MPC) regularly examines market-based measures of inflation expectations and real interest rates derived from sterling inflation-linked instruments.<sup>(2)</sup> However, at times changes in market structure and market frictions may mean that these measures need to be interpreted with care. An understanding of current and potential future developments is therefore important for monetary policy makers.

**Diagram 1** summarises the structure of the sterling inflation-linked market as it currently stands. The next section of the article examines developments in demand from those who wish to receive inflation-linked cash flows. The article then examines the supply of inflation-linked cash flows, focusing in particular on the growth in new sources of supply. Finally, the article considers the microstructure of the sterling inflation-linked market, especially how financial intermediaries match demand and supply flows, how inflation risk is transferred, and also considers examples where market frictions may have affected pricing in the market.

## Demand for inflation-linked cash flows

Increased demand for inflation-linked cash flows from institutional investors, especially pension funds, has been regularly cited by market participants as an important catalyst for rapid growth in the sterling inflation-linked market over recent years.

Institutional investors dominate the index-linked gilt (IG) market, with pension funds and insurers directly holding around three quarters of IGs (**Chart 1**). The primary purpose of the majority of these holdings is for pension providers to hedge their liabilities which are typically linked to inflation. In

(1) An inflation-linked bond is typically one in which the coupon and principal payments are adjusted for inflation over the period since issuance. As the adjustment is based on changes in a price index, such as the retail prices index (RPI), they are also referred to as index-linked bonds. An inflation swap is an agreement to exchange fixed-interest payments (on a notional amount) for payments which vary according to inflation. For a more in-depth description see Deacon *et al* (2004).

(2) In bond markets, the difference between yields on nominal and inflation-linked bonds are referred to as (implied) breakeven inflation rates. In swap markets, breakeven inflation rates refer to the rates on the fixed leg of the swap. See Scholtens (2002) and Hurd and Relleen (2006) for more detailed explanations of these measures.

Diagram 1 The structure of the market for inflation-linked products in the United Kingdom

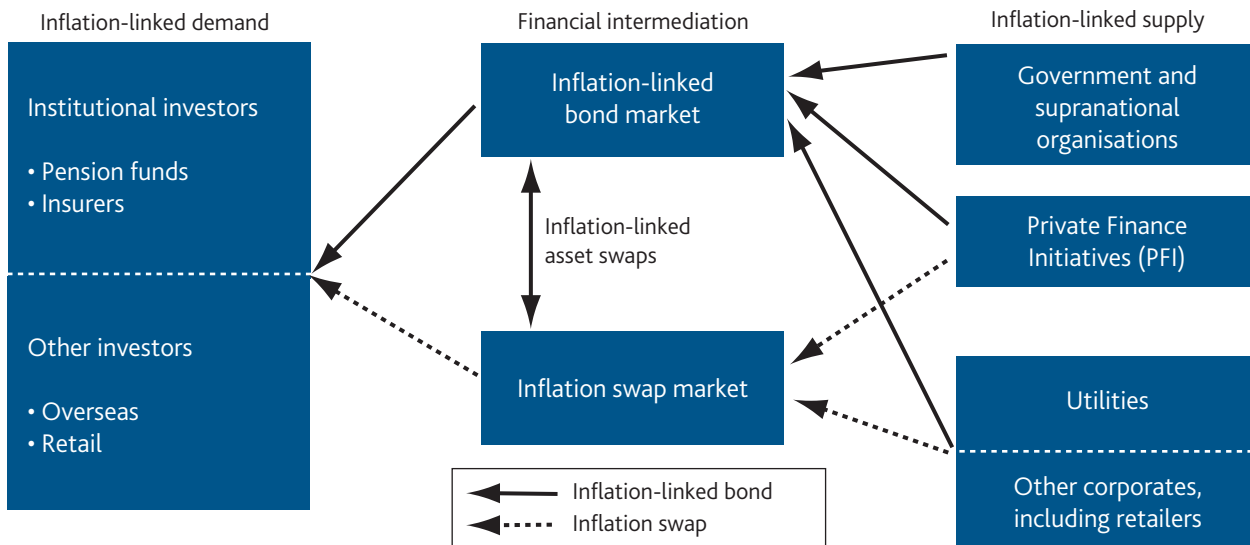
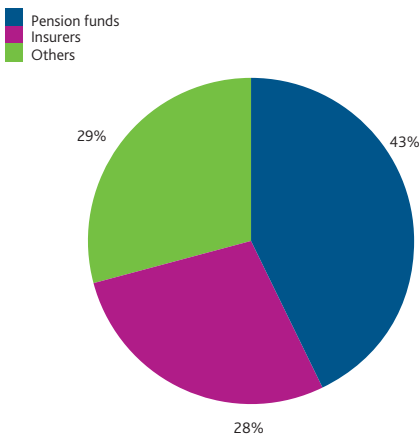


Chart 1 Holdings of index-linked gilts (June 2006)



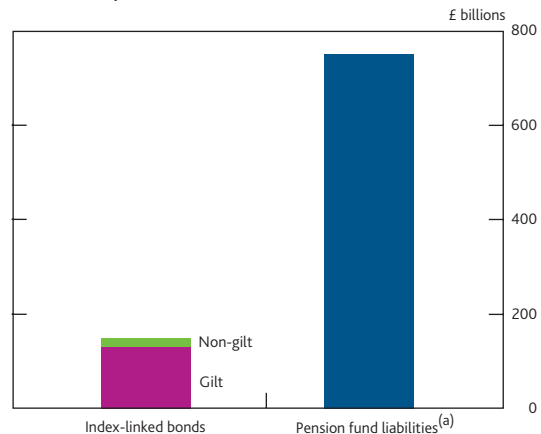
Sources: Barclays Capital, ONS and Bank calculations.

In addition to direct holdings by pension funds, this is also true of holdings by insurers, as they sell pensions products themselves.

Holdings of IGs by banks, dealers and hedge funds may also represent hedging of inflation-linked cash flows to pension funds, since institutional investors increasingly receive such cash flows via inflation swaps. As explained later, much of the inflation-linked cash flows from an IG may be transferred to a UK pension fund even if the registered holder is a bank, dealer or hedge fund. And if the latter is registered overseas, that may perhaps give a misleading impression in ONS data of the scale of overseas exposure to IGs.

The size of potential demand from institutional investors means that even proportionally small changes in demand could have a major impact on the sterling inflation-linked market (Chart 2). The IG market in total has a market capitalisation of around £120 billion,<sup>(1)</sup> and the

Chart 2 Inflation-linked bonds outstanding relative to estimated pension fund liabilities



Sources: Barclays, Dealogic, the Pensions Regulator and Bank calculations.

(a) Midpoint of £725 billion–£775 billion range.

non-government inflation-linked bond market has a value of around £18 billion. In July 2006 the existing liabilities of UK pension schemes were estimated to be £725 billion–£775 billion,<sup>(2)</sup> and additional liabilities will continue to accrue for many years.<sup>(3)</sup> So even asset hedging flows that represent a relatively small proportion of these liabilities have the potential to have a major impact on the inflation-linked market.

The move by pension funds to invest in assets more closely matching the characteristics of their liabilities seems to be due to the increased aversion of trustees and corporate sponsors to volatile pension fund valuations. This may be the result of a combination of factors:

(1) According to the Barclays Capital Gilt Inflation-Linked Bond Index.  
 (2) As estimated on an FRS17 basis in the Pensions Regulator's *Annual Report and Accounts, 2005–06*.  
 (3) In addition, closed schemes may seek to sell liabilities to insurers in the bulk annuity market. These insurers are required to match such products closely, suggesting that they will also have to pursue liability-matching strategies.

- Declines in equity values during 2001–03, falls in long-term interest rates, and upward revisions to longevity assumptions have resulted in many pension funds facing accounting deficits as the market value of their assets fell while the discounted present value of their liabilities increased.
- Changes to pension fund regulation and accounting standards have introduced more market-based valuation methods and required pension fund deficits to be explicitly recognised on the sponsoring companies' balance sheets.<sup>(1)</sup> Pension fund regulation can be particularly important in mergers and acquisitions, or leveraged buyouts as a large or volatile deficit may deter potential buyers.

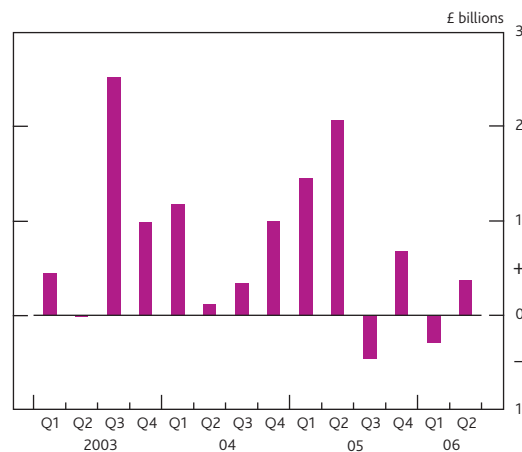
For defined-benefit (DB) pension funds (which currently form the majority of funds), liabilities usually have a long duration (ie have a valuation sensitive to changes in long-term interest rates). They are also inflation linked both directly, because retirement pensions are often linked (at least partially) to inflation, and indirectly, because a final salary scheme's liabilities rise with wages, and wage growth is correlated with inflation.<sup>(2)</sup>

The simplest strategy for hedging against inflation and interest rate risk involves direct portfolio switching into (long-duration) index-linked bonds, either through the purchase of IGs or sterling corporate index-linked bonds. These securities have the advantage that they provide both a duration and an inflation hedge. This approach of buying securities to match the duration and characteristics (eg inflation risk) of liabilities has been termed asset liability matching (ALM).

ONS data do show that over the past few years institutional investors have made substantial net purchases of index-linked gilts (Chart 3). They are also the main purchasers of corporate index-linked bonds, of which there has been significant issuance recently (discussed later). And while long-maturity bonds better suit the duration of these investors' liabilities, market contacts report that they are willing to buy IGs at all maturities in order to improve inflation matching. Some of these purchases have been funded by higher contribution rates to pension schemes, others by reducing allocations to other assets (eg equities).

Full matching of interest rate and inflation risk using bonds can leave a fund relatively neutral to changes in discount rates or inflation. However, the ALM approach has the disadvantage that the low-risk assets purchased have a relatively low expected real return. This can make full matching relatively costly for a fund with a deficit as it could 'lock in' the need for higher pension contributions on the part of the sponsoring company. And the purchase of corporate index-linked bonds can expose the fund to unwanted long-maturity credit risk.

Chart 3 Institutional investors' net purchases of index-linked gilts

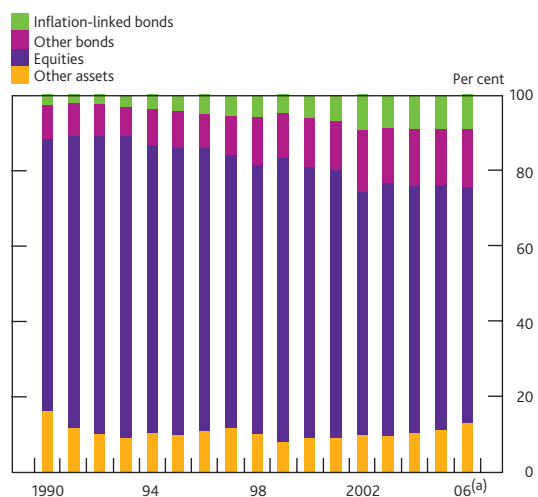


Sources: ONS and Bank calculations.

This may explain why few funds have pursued a full matching approach.

Indeed, although there have been some high profile examples of large pension funds moving into index-linked bonds, at an aggregate level the move has been more incremental (Chart 4).

Chart 4 Pension fund asset allocations



Source: WM Performance Services.

(a) End of Q3.

Another reason for this may be that the development of the inflation swaps market has facilitated an alternative approach to matching inflation liabilities. By using inflation swaps in combination with interest rate swaps,<sup>(3)</sup> a pension fund's

- (1) The box 'Recent developments in UK pension fund regulation' on page 10 of the Spring 2006 *Quarterly Bulletin* examines these changes in more detail.
- (2) The box 'Pension fund valuation and liability driven investment strategies' on page 8 of the Spring 2006 *Quarterly Bulletin* outlines in more detail the factors affecting the asset and liability valuation of DB pension funds.
- (3) An interest rate swap is an agreement to exchange fixed-interest payments (on a notional amount) for floating payments which vary with an agreed interest rate, eg Libor.



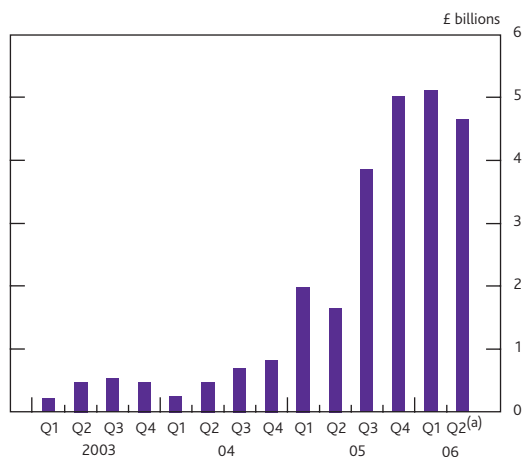
cash flows can be more closely tailored to match characteristics of their liabilities than may be possible with bonds: whereas the payment schedules on bonds are set at issuance, the payments on swaps can be negotiated at the time the swap is entered into. As there is no initial outlay when a swap is agreed, this approach offers the possibility that more of the fund can be invested in risky assets for higher expected returns. This use of derivatives, known as a 'swap overlay', effectively adds some leverage to the fund.

The broad approach of these swap overlay strategies — in combination with investing the majority of the fund in a diversified portfolio to generate returns — has been termed 'liability driven investment' (LDI). Typically, the pension fund will be left with future outlays linked to a market interest rate such as Libor, which must be funded by the returns on its risky assets. As an aside, some asset managers have reported that pension funds are looking for returns on risky assets of 100 to 150 basis points higher than their investment benchmark, compared to 50 basis points in previous years, seemingly to try to narrow their deficits.

Not all pension funds have a mandate and/or the expertise to invest in derivatives. However, financial intermediaries have recently begun to offer 'pooled' products which can provide inflation protection (often using inflation derivatives) in a form that small and medium-sized pension funds can invest in. The provider manages the cash flows from the derivatives, and the documentation that goes with it. This provides a means for smaller pension funds to pool their assets and engage in LDI.

Available data suggest that there has been a rapid growth in turnover in the inflation swap market (Chart 5), with high demand sustained over recent quarters. Market contacts suggest that a significant part of this demand may be related to the implementation of inflation swap overlay strategies.

Chart 5 Notional value of UK RPI swaps traded



Sources: ICAP estimates and Bank calculations.

(a) Quarterly estimate using data for April and May.

Survey data suggest that by mid-July 2006, only a small proportion (around 4%) of corporate pension funds had begun to use inflation derivatives.<sup>(1)</sup> However, even this level of demand could represent tens of billions of pounds worth of notional demand for inflation swaps.

A key question for the sterling inflation-linked market is the potential size of inflation-hedging demand from institutional investors going forward (and the ability of the market to meet any increased demand). The likely size of such demand will depend on a number of factors:

- the degree to which defined-benefit pension liabilities will rise in the future and to what extent pension funds will seek to match their existing and future liabilities;<sup>(2)</sup>
- the relative importance pension funds place on matching duration relative to matching inflation-linked liabilities;
- for those seeking to hedge inflation liabilities, whether they will use inflation-linked bonds or swaps to achieve this matching; and
- the emphasis placed on closing pension fund deficits in the context of mergers and acquisitions or leveraged buyout activity.

In summary, although to date only a minority of pension funds have pursued full matching strategies involving large-scale switching into sterling inflation-linked products, limited reallocation still represents a significant increase in demand relative to the size of the market. The potential size of future demand remains very significant, but there is uncertainty as to how much of this will be realised, and the timing of any flows.

## Supply of inflation-linked cash flows

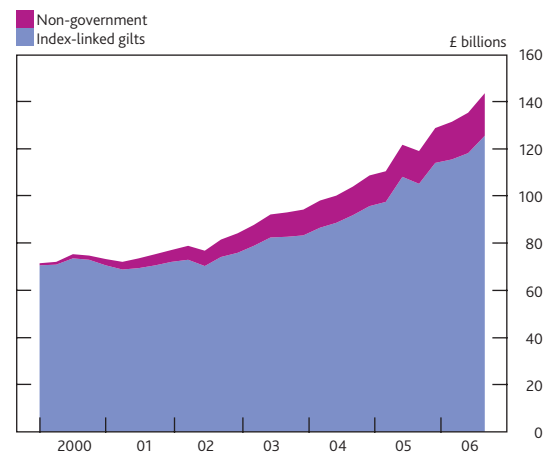
This section examines the sources of supply of sterling inflation-linked cash flows in both the bond and swap markets.

In terms of the outstanding value of sterling inflation-linked debt, the market is dominated by IGs (Chart 6). The large proportion of IGs in total inflation-linked assets outstanding reflects the fact that the UK government has been the primary issuer of sterling inflation-linked products since IGs were first issued in 1981. And IG issuance has recently been at record levels, particularly at longer maturities (fifteen years and above) where institutional demand has been strongest as the duration of UK pension fund liabilities is typically about 20 years (Chart 7).

(1) According to *Pension financial risk — survey of FTSE 350 companies* published by Mercer in July 2006.

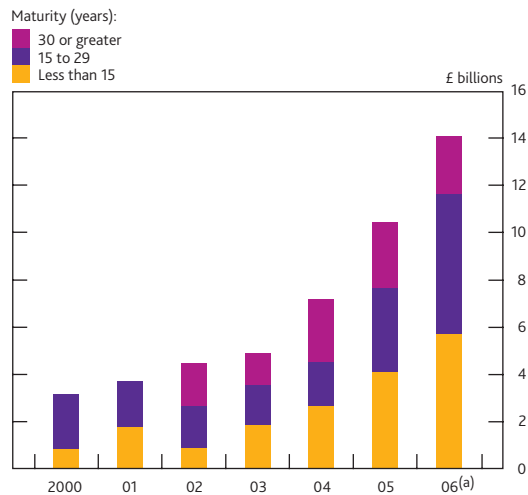
(2) The number of defined-benefit pension schemes is falling as schemes are either closed completely or closed to new members. Nevertheless, existing defined-benefit schemes will continue to accrue additional liabilities for many years to come.

**Chart 6** Market capitalisation of sterling inflation-linked bonds



Sources: Barclays Capital, Dealogic and Bank calculations.

**Chart 7** Index-linked gilt issuance



Source: Debt Management Office.

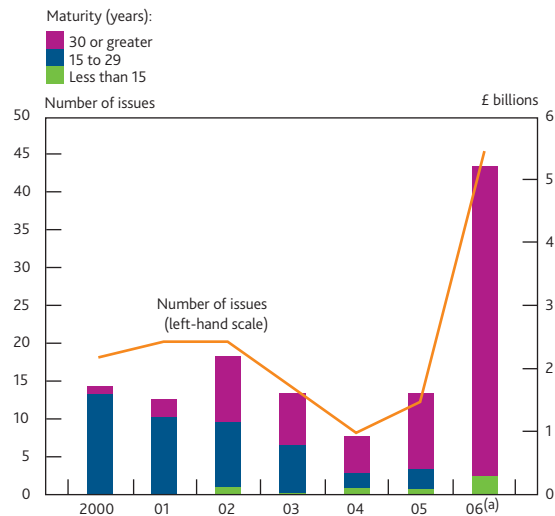
(a) Year to 17 November 2006.

However, there has recently also been rapid growth in non-government supply of inflation-linked instruments, with the majority of issues at maturities greater than 30 years (Chart 8). Non-gilt inflation-linked cash flows come from a variety of sources, examined in the box on page 391.

A number of factors have driven this recent supply of inflation-linked cash flows from non-gilt sources:

- The low level of real rates (especially at long maturities) has encouraged companies to use funding with inflation-linked repayments in order to lock in low financing costs.
- As a result of the apparent increase in demand, intermediaries are increasingly seeking to bring new sources of inflation-linked supply into the sterling market (eg property companies with rental payments linked to inflation).

**Chart 8** Non-government sterling inflation-linked bond issuance



Source: Dealogic.

(a) Year to 17 November 2006.

- Additionally, a number of large PFI projects have been approved during 2006 and a significant amount of the anticipated revenues have been hedged in the sterling inflation-linked market.
- The growth of the credit market and willingness of insurance companies to insure against default in corporate bonds (known as 'credit wrapping') have improved the ability of companies to issue highly rated debt, which is more appealing to UK institutional investors.

In the past, a corporate issuer seeking inflation-linked financing might have done so directly by issuing an inflation-linked bond. But the rates on offer for payments linked to inflation have at times been more attractive in the swap than the bond market (see the box on page 392 for an explanation of this). In response to this, financial intermediaries are increasingly able to arrange complex funding solutions that make use of the inflation swap market.

For example, a company can issue a nominal bond and simultaneously agree with the buyer of the bond to swap the nominal cash flows on it for inflation-linked cash flows. Alternatively, they can issue an inflation-linked bond to a special purpose vehicle (ie a company specially created for financing purposes), that in turn pays the inflation-linked cash flows to the swap market. By allowing corporates to achieve inflation-linked funding at more attractive rates, these complex strategies have probably helped increase the supply of inflation-linked cash flows, and the efficiency of the market as a whole.

Looking forward, maintaining the relatively high non-government inflation-linked issuance seen during the first half of 2006 will require a continued increase in

## Supply of non-gilt sterling inflation-linked assets

As noted in the main text, the supply of non-gilt inflation-linked cash flows has grown rapidly in importance in the sterling market. This supply can be in the form of inflation-linked bonds, or, increasingly, inflation-linked swaps facilitated by an intermediary. These underlying inflation-linked cash flows come from a variety of sources:

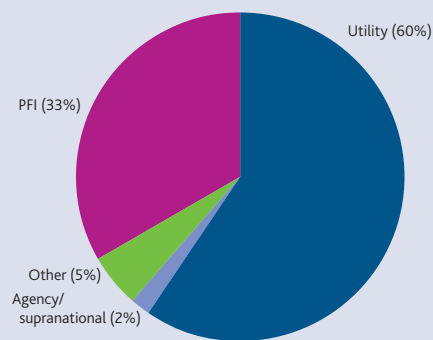
- Regulated utilities — these are companies with cash flows that are partly subject to government regulation, including privatised utilities such as water, electricity and gas firms. Typically their pricing structure will be set by the regulator, with some prices allowed to rise each year by inflation (plus or minus a certain percentage). That gives rise to a flow of revenues linked to some degree to inflation.
- Private Finance Initiatives (PFIs) — under these public finance schemes, a private company pays for and runs a public infrastructure project (for example, building and maintaining a school or hospital) for a number of years. In return, the government pays the company an income stream, often inflation-linked.
- Other corporates — some private sector contracts are directly linked to an inflation index (eg some property leases and outsourcing contracts). However, they are relatively few in number. Corporates that have an indirect inflation exposure might also be tempted to issue an index-linked bond or make inflation-linked payments in the swap market. A key factor here is the correlation of the company's revenues with inflation. For example, in recent years Tesco has issued £600 million worth of RPI-linked debt: as a retailer selling a large number of products in the RPI basket, it is argued that the correlation will be high. But these types of corporate issuers only account for around 12% of total non-government inflation-linked bonds outstanding, suggesting that few corporates with an indirect exposure to

inflation-linked funding. But a number of issuers have reportedly already brought forward issuance plans to take advantage of low rates, which perhaps raises questions about the sustainability of current issuance levels. One key source will be PFI contracts, with about £1.5 billion of NHS projects expected over coming years,<sup>(1)</sup> some of which may be funded in inflation-linked markets. There may also be a growth in 'new' sources of supply, including commercial property agreements, which have the potential to provide substantial supply to the market as leaseback agreements are often linked to RPI.

inflation have considered the correlation to be high enough to use inflation-linked funding.

- Agencies/supranational — these are AAA-rated organisations with direct government guarantees. They issue in the inflation-linked market if they can achieve a lower cost of funding, but often swap the inflation-linked cash flows immediately back into nominal cash flows, resulting in no net supply to the inflation-linked market. The European Investment Bank (EIB) has been the most active in the sterling market.

Chart A Issuers of sterling non-government inflation-linked bonds in 2006



Source: Dealogic.

Although non-government supply has increased, a disincentive to using inflation swaps remains in the form of derivatives accounting regulations. In particular, IAS 39 requires that, for an inflation swap to qualify as a hedge for accounting purposes (and thus remove changes in the value of the swap position from a company's profit and loss statement), a company's cashflows must be explicitly linked to inflation for the length of the swap. For most corporates and utilities (whose revenues are typically only explicitly linked to inflation for the next five years) this means that long-dated inflation swaps could be a potential source of profit volatility, decreasing their attractiveness as part of a funding package. This is less of a problem for PFI projects, the cash flows of which are typically inflation-linked for long periods.

## Microstructure of the sterling inflation market

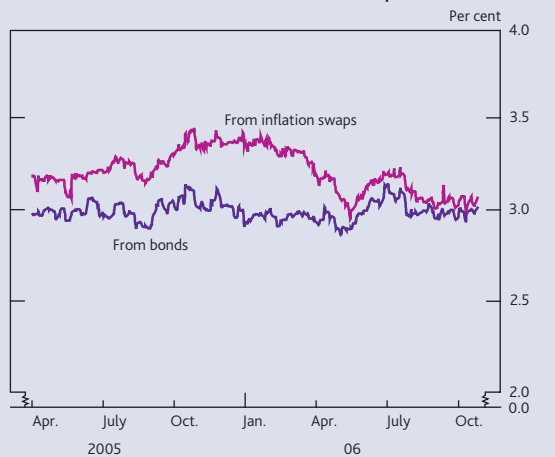
Although both supply and demand in the sterling inflation-linked market have increased in recent years, they are sometimes not perfectly matched. Specifically, institutional demand sometimes does not match the duration or timing of supply from government IG issuance and other suppliers. For example, a utility may issue a 40-year inflation-linked bond,

(1) As outlined in a Department of Health press release, 18 August 2006.

## Inflation-linked asset swaps: connecting bond and swap markets

Theory would suggest that breakeven inflation rates derived from the difference between the yields on nominal and conventional bonds and those implied by the fixed-rate leg of an inflation swap should be equal, as they both effectively represent the price of securing payments linked to RPI.<sup>(1)</sup> However, at times these rates have diverged by up to 40 basis points (**Chart A**). Market contacts suggest these divergences may have been due to differences in demand and supply between the markets. While institutional demand for inflation-linked swaps is heightened because swap payments can be more closely tailored to pension fund liabilities, the repayment profiles of bonds tend to be a better match for the funding targets of issuers of inflation-linked cash flows.

**Chart A** Twenty-year forward breakeven inflation rates derived from bonds and inflation swaps<sup>(a)</sup>



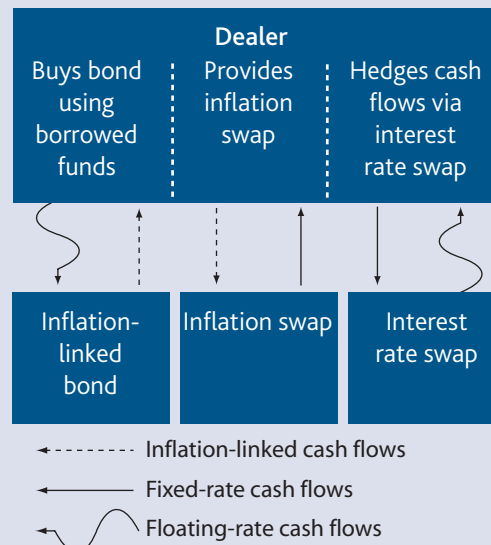
(a) Instantaneous inflation forward rates derived from the Bank's government liability curve and inflation swap rates.

Inflation-linked asset swaps provide a means of balancing supply so that prices come into line across swap and bond markets; a possible asset swap structure is summarised in **Diagram A**. In this example the dealer borrows funds (at a floating rate of interest) to purchase an inflation-linked bond, and simultaneously agrees to pay inflation-linked cash flows (usually to a pension fund) in an inflation swap. Then, to match the cash flows on the first two transactions, the dealer swaps the fixed cash flows from the inflation swap for floating payments, which are used to fund the original purchase of the bond.

but a pension fund may prefer to receive a series of inflation-linked cash flows with a maturity of 20–30 years. This section considers the role of financial intermediaries that try to balance supply and demand, and how temporary mismatches can affect market rates.

Financial intermediaries have improved the efficiency of inflation-linked markets by being able to shape the characteristics

**Diagram A** Inflation-linked asset swap



The simplified net result is that the dealer will receive inflation-linked cashflows from the bond market, and supply inflation-linked cashflows to the inflation swap market. As the breakeven inflation rate in the bond market represents the premium paid by the dealer to receive inflation-linked cashflows from a bond, and the breakeven inflation rate in the swap market represents the price paid by the pension fund to receive inflation-linked cashflows from the dealer, the dealer makes a net gain if swap breakeven inflation rates are higher than bond breakeven inflation rates.

Asset swaps can also be used by issuers who wish to take advantage of the higher breakeven inflation rate available in swap markets, but would prefer the repayment profile associated with a bond. In this case a financial intermediary arranges an asset swap at the same time that the bond is issued.

The increased use of asset swaps involving both existing and newly issued bonds has probably contributed to the narrowing of the gap between breakeven inflation rates derived from government bonds and those implied by inflation swaps (**Chart A**).

(1) See Hurd and Relleen (2006) for more detail on the determinants of breakeven inflation rates.

of underlying issuance to improve the match with institutional demand. This includes offering the means to improve the credit quality of bonds, and transforming repayments on bond issuance into inflation-linked swap payments, which can be more closely tailored to the profile of pension fund demand. Some banks are also said to have used inflation-linked cash flows in corporate loanbooks and commercial property leases to hedge inflation-linked swap liabilities.

But the timing mismatch between inflation-linked supply and demand raises questions about whether large flows leave financial intermediaries holding significant risk for any length of time. For example, if an intermediary enters into an agreement to receive inflation-linked cash flows from a company, there may be a delay before it agrees to pay out those cash flows to a pension fund. This could either be because it is waiting for sufficient institutional demand, or because it thinks market rates will move in a favourable way. Market contacts have reported that such 'warehousing' of inflation risk does happen to some degree, at times leaving intermediaries with large unhedged positions and hence market risk.

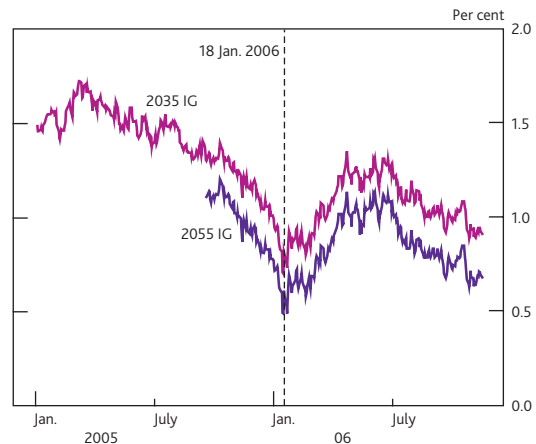
This market risk could be exacerbated by the relative illiquidity and smaller size of inflation-linked markets compared with equivalent sterling nominal markets. The frequency with which IGs are traded is around 20% of that of conventional gilts,<sup>(1)</sup> reflecting the fact that institutional investors often buy IGs in order to hold them to maturity. Corporate index-linked bond turnover is reported to be even lower.

IGs and inflation swaps also tend to involve higher trading costs than their conventional counterparts, in the form of spreads between prices bid and offered by dealers. However, the increased size of the inflation-linked market has been accompanied by increased competition, and market contacts have reported a narrowing of bid-offer spreads and an increase in liquidity in recent years. The seasonality of inflation is a further consideration market participants must take into account when entering the inflation-linked market (see the box on page 394).

The relatively unpredictable nature of both demand and non-government supply can have an impact on the price of inflation-linked assets (and hence real interest rates and breakeven inflation rates). An example of this occurred in January 2006. Contacts suggest that in mid-January some investors speculated that long-term real rates had fallen too low and would return to more usual levels: some speculators had taken short positions in very long-dated IGs (for example those maturing in 2035 and 2055), and some index-fund managers held less of these bonds than their benchmark allocation. But institutional demand (and temporary uncertainty about future PFI issuance) continued to push rates lower, resulting in a 'short squeeze' whereby those speculative players and fund managers were forced to buy the IGs in order to prevent further losses. As a result, ultra-long real rates fell to record lows on 17 and 18 January (Chart 9).<sup>(2)</sup>

Rates subsequently rose in the first part of 2006, apparently reflecting quiet institutional demand, according to market contacts, and greater inflation-linked supply. However,

Chart 9 Yields on long-maturity index-linked gilts



Source: Bloomberg.

renewed strength of institutional demand in recent months has seemingly caused real rates to fall once again.

Supply and demand imbalances can also affect the inflation swap market. As discussed in the box on page 392, strong institutional demand to receive inflation-linked cash flows from swaps has at times driven a wedge between breakeven inflation rates implied by swaps and those derived from bonds. Furthermore, the less transparent nature of the timing and size of non-government supply can add volatility to rates in the swap market. Whereas the timetable for IG issuance is published well in advance by the Debt Management Office, the timing of payments by corporate issuers into the inflation-linked swap markets is generally not known beforehand.

Hedge funds and other participants that try to profit by taking speculative positions can play an important role in sterling inflation-linked markets by improving pricing in the market — including by entering into asset swaps. But the tendency for market rates to move for non-fundamental reasons (as in January) can lead to a high level of volatility in the value of such positions, which may deter some of these participants.

For policymakers, it is important to be aware that the supply and demand flows and market characteristics such as trading costs and illiquidity can affect observed market rates, at least temporarily. This is particularly significant at longer maturities, where rates are particularly sensitive to fluctuations in non-government supply and institutional demand.

(1) Monthly gilt turnover as a percentage of market capitalisation. Source: DMO.

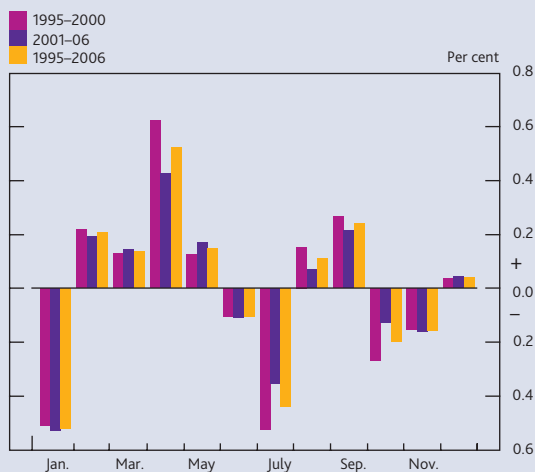
(2) These developments were discussed in detail in the 'Markets and operations' section of the Spring 2006 *Quarterly Bulletin*. For a description of the theoretical determinants of long-maturity rates see the box 'Interpreting long-term forward rates' on page 418 of the Winter 2005 *Quarterly Bulletin*.

## Seasonality and inflation-linked markets

Unlike conventional instruments, inflation-linked market instruments provide payments that are typically based on the level of seasonally unadjusted price indices. Monthly inflation tends to vary depending on the time of year, and market contacts often mention these seasonal factors as being important for market pricing. This box looks at how inflation seasonality may affect observed market prices and rates.

**Chart A** shows the average seasonal pattern of the United Kingdom's RPI inflation measure, which is the main reference index for the sterling inflation-linked market. These trends arise because of pricing patterns in the components of the indices: for example, clothing prices typically fall during the January sales. Seasonal patterns may change over time; indeed, **Chart A** shows that RPI seasonality has changed slightly since 2001.

**Chart A** Seasonality of RPI<sup>(a)</sup>



(a) Average deviations from twelve-month averages.

Coupon and redemption payments on IGs are adjusted upwards according to the growth in the relevant index between the issuance date and a reference month. This reference month is typically three or eight months prior to the month that the payment is due,<sup>(1)</sup> in order to allow time for the index to be published and the payment calculated. Differing final reference months mean that some IGs will be expected to offer greater nominal returns than others due to the seasonal pattern of monthly inflation. For example, the IGs maturing in 2009 and 2011 have final reference months of September and December respectively. In the past, the growth in the index between October and December has been about 0.3 percentage points lower than at other times of the year. So, in proportion to its maturity, the 2009 IG might be expected to provide a higher nominal return than the 2011 IG (abstracting from factors other than seasonality). This should be reflected in a higher breakeven inflation rate for the

2009 IG than the 2011 IG. And the effect will become more pronounced as time to maturity decreases and the change in the index in the final months becomes relatively more important.

Seasonality could also lead to a general rise in the price of IGs at certain times of the year. Higher RPI outturns result in higher nominal payments on the bond, which come in the form of semi-annual coupons and the final payment of principal. Other things being equal, that would widen the gap between real and nominal yields, raising implied breakeven inflation rates.

Inflation swaps are generally entered into for whole years over which seasonal effects sum to zero. But seasonality is important when marking-to-market the value of existing swap positions. For example, if a swap has six months to maturity, the expected seasonality over this period will affect its valuation. Market participants typically use monthly forward rates based on their predictions of seasonality to value these swaps. Again, the shorter the time to maturity, the more important will be the role of seasonality.

Seasonality can also be important in understanding moves in inflation swap rates when the reference month changes. Payments on the inflation leg of an inflation swap are based on the growth of the index over the tenor (or period) of the swap, lagged two months. For example, a two-year inflation swap entered into in June 2007 will be based on the expected growth of the RPI index between April 2007 and April 2009. In July the reference month will change to May, and the swap rate will be based on the growth in the index between May 2007 and May 2009.

On the day the reference month changes there may be a jump in the quoted two-year inflation swap rate. The size of this jump will depend on the change in the index between April and May 2006, and market estimates of the change in the index between April and May 2008, probably based on forecast differences in RPI seasonality between April and May. Forward rates derived from swaps should be unaffected by this rolling of reference months.

(1) Payments on recently issued IGs tend to be referenced to the level of RPI with a three-month lag. IGs first issued prior to September 2005 have an eight-month lag.

## Summary and conclusions

This article has examined sterling inflation-linked markets. These markets have developed significantly in recent years, involving a larger number of participants, a wider range of instruments and greater market activity. Institutional investors appear to have increased their demand for sterling inflation-linked products, primarily to hedge pension fund liabilities, and this demand has drawn new sources of supply into the market.

The role of financial intermediaries has become more important as they reconcile mismatches in the timing and structure of inflation-linked supply and demand. In particular, this has facilitated increased supply of inflation-linked cash

flows from non-government sources, which intermediaries have helped tailor towards the profile of pension fund demand.

Overall, this has improved the efficiency with which inflation risks are transferred between agents. However, liquidity in the index-linked market remains lower than in the conventional market and rates can still be sensitive to supply and demand flows. These issues are important for policymakers to understand when interpreting rates observed in inflation-linked markets.

Looking forward, the key issues for the sterling inflation-linked market will be the strength of demand from institutional investors for inflation-linked assets, and the willingness and ability of suppliers of inflation-linked cash flows to meet it.

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# The state of British household finances: results from the 2006 NMG Research survey

By Matt Waldron and Garry Young of the Bank's Monetary Assessment and Strategy Division.

This article summarises the key results from the latest survey carried out for the Bank by NMG Research about the state of household finances. There was little change in the proportion of households who reported problems with their unsecured debt, although there was a small increase in the proportion of mortgagors having difficulty paying for their mortgage. The share of overall income accounted for by households reporting either type of problem was relatively small, suggesting that any impact on aggregate consumer spending is likely to have been muted. The most common explanations given for debt problems were temporary cash-flow shortfalls and overspending; the most popular way of resolving these issues was to cut back spending. Very few households said they considered bankruptcy a solution to their debt problems.

## Introduction

The rapid increase in household debt in recent years has raised questions about the ability of people to repay what they owe. This could have implications for monetary policy if debt problems were widespread and those affected cut their spending sharply. A box in the November 2006 *Inflation Report* (page 15) concluded that the implications of recent debt repayment problems for monetary policy are likely to be small. That is because the households experiencing difficulties repaying their debt likely account for a small proportion of overall consumer spending. It could also have implications for financial stability if a significant number of households were to default on their debts. To throw light on the extent of debt problems, this article investigates the financial position of a sample of households that is representative of the British population.

In September 2006, NMG Research surveyed a representative sample of around 2,000 people and asked them how much debt their household owed, whether they found this to be a burden, whether they felt constrained in the amount they could borrow and their attitudes to bankruptcy. Those who said they were experiencing some difficulty in keeping up with their debt payments were asked what had caused this and what they intended to do about it.<sup>(1)</sup> The box on page 403 contains more details about how the survey was conducted.

The survey is the fourth that the Bank has commissioned NMG Research to conduct on household finances.<sup>(2)</sup> Taken

together with information from successive waves of the British Household Panel Survey (BHPS), it sheds light on trends in the extent of financial stress at the household level throughout the British population.

## Distribution of debt

As in past surveys, debt was not evenly distributed across the households who participated. While 57% of households had some debt, 43% had none (**Table A**). These proportions had hardly changed since 1995. Debt was heavily concentrated among mortgagors, who owed 96% of the outstanding stock

**Table A** Percentages of households with secured and unsecured debt<sup>(a)</sup>

	BHPS 1995	BHPS 2000	NMG 2004	NMG 2005	NMG 2006
None	46	45	42	43	43
Unsecured only	15	15	23	20	22
Secured only	19	18	13	16	14
Both	21	21	22	21	21

Sources: BHPS, NMG Research surveys and Bank calculations.

(a) The 2006 NMG survey did not contain questions about second homes and mortgages. As a result, the figures in **Table A** exclude mortgages that outright owners and renters may have on second properties. Figures from past surveys have been recalculated to be consistent with the 2006 survey. Figures may not sum to 100 due to rounding.

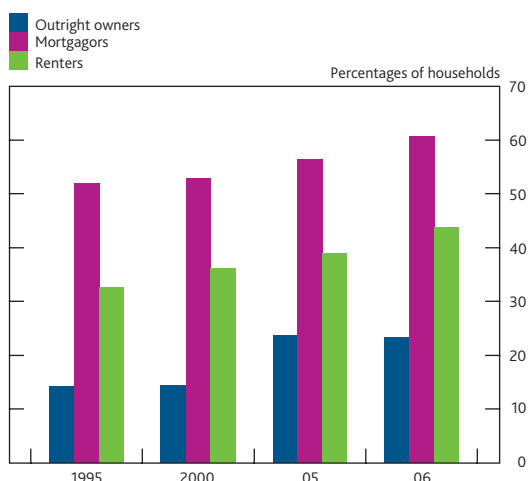
(1) The raw survey data are provided at [www.bankofengland.co.uk/publications/quarterlybulletin/nmgsurvey2006.xls](http://www.bankofengland.co.uk/publications/quarterlybulletin/nmgsurvey2006.xls).

(2) See Barwell, May and Pezzini (2006) for details of the 2005 survey.

of debt identified in the survey: 100% of the secured debt and 62% of the unsecured debt.

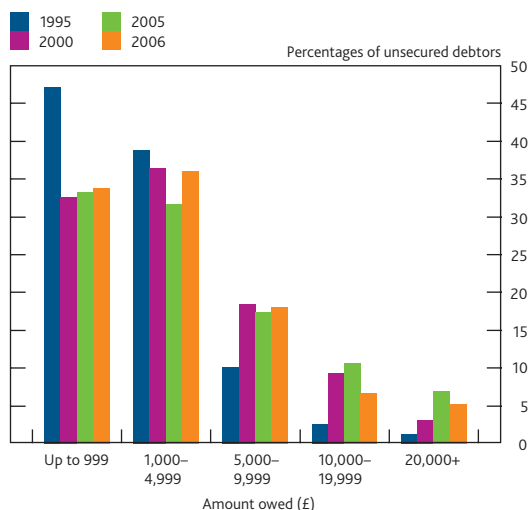
While there was little change in the overall proportion of households with debt, this masks a change in the distribution of debt across types of households.<sup>(1)</sup> In particular, the proportion of renters with unsecured debt had continued to rise (**Chart 1**). While renters account for a very small proportion of overall outstanding debt (3%), they might be more prone to default than homeowners because they do not have housing equity to draw on if they face financial difficulties.<sup>(2)</sup> There were also increases in the proportion of mortgagors and outright homeowners with unsecured debt. But the overall proportion of households with unsecured debt was little changed (**Table A**). That is because more homeowners owned their homes outright in the 2006 survey than in past surveys and those who own their homes outright are less likely to have any unsecured debt (**Chart 1**).

**Chart 1** Proportion of households with unsecured debt by housing tenure



Sources: BHPS, NMG Research surveys and Bank calculations.

**Chart 2** Distribution of unsecured debt

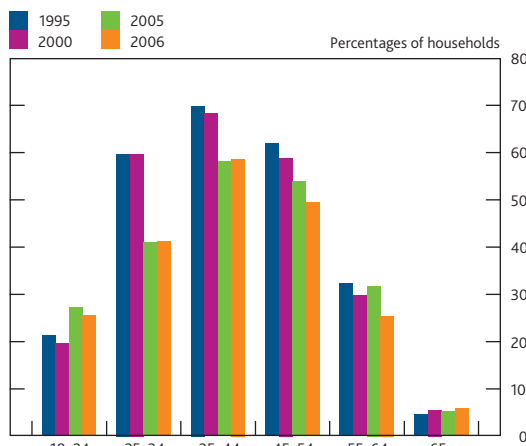


Sources: BHPS, NMG Research surveys and Bank calculations.

The quantity of unsecured debt reported by participating households continued to be unevenly distributed (**Chart 2**). While most debtors reported outstanding debts of less than £5,000, around 5% said that they owed more than £20,000. Other things equal, the households most likely to default on their loans would be those with low incomes in relation to their debts and little or no housing equity. The majority of renters with debt owed small amounts with seemingly affordable repayments. But a small minority (9% of renters with debts) had unsecured debts in excess of their annual pre-tax income.<sup>(3)</sup> Such households are likely to be experiencing severe difficulties in servicing their debts but this is a very small proportion of households as a whole (around 1%).

There have been changes in the types of households with secured debt. Relative to 1995 and 2000, a smaller proportion of 25–34 year olds had secured debt (**Chart 3**). This is likely to be the result of higher house prices making it more expensive for younger households to enter the housing market. Higher house prices are also likely to be one of the factors behind an increase in the dispersion in the amount of secured debt owed, since new entrants to the housing market need to borrow more than would have been the case in the past. **Chart 4** shows that the distribution of secured debt had shifted to the right: the proportion of mortgagors with small mortgages had fallen and the proportion with large mortgages had risen. This may also reflect remortgaging. Just under 15% of mortgagors had taken out an additional mortgage in the twelve months prior to the survey. This is a little lower than in 2005. The main purpose given for the additional loan was to fund home improvements, but 22% of respondents said that they had used some or all of it to consolidate other debts.

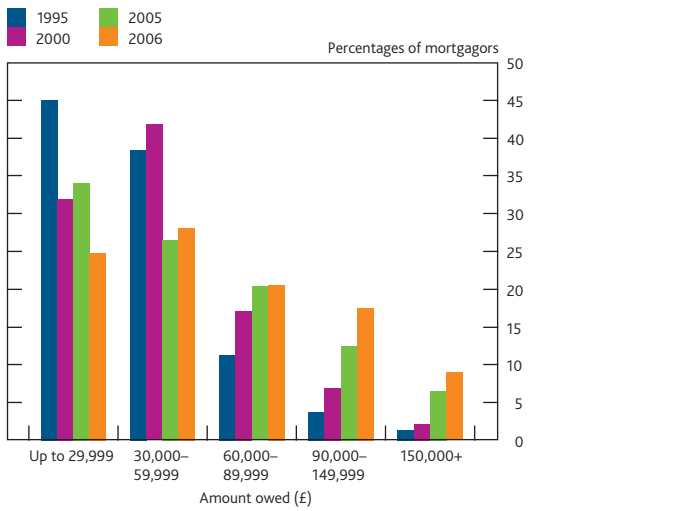
**Chart 3** Proportion of households with debt secured on their home by age



Sources: BHPS, NMG Research surveys and Bank calculations.

(1) Since the 1995 BHPS survey, there had also been changes in the types of debt being used by households. Student loans and overdrafts had become more prevalent, while hire purchase agreements and personal loans had become less common. But credit cards remained the most commonly used type of unsecured debt.  
 (2) As an example of this, the Insolvency Service estimates that only around 10% of bankrupt individuals have secured debt arising from mortgaged property.  
 (3) That number had increased from 7% in the 2005 survey.

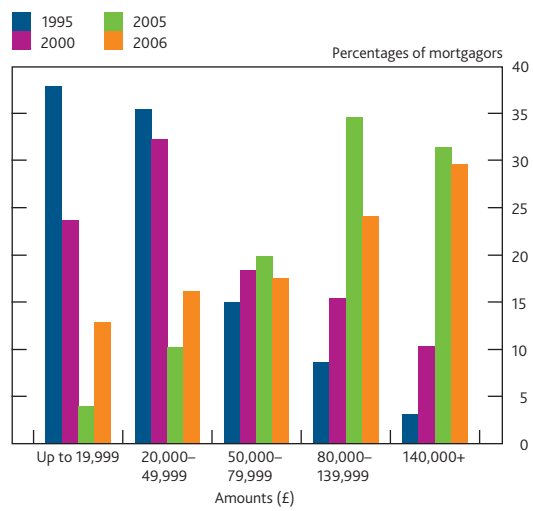
**Chart 4** Distribution of secured debt<sup>(a)</sup>



Sources: BHPS, NMG Research surveys and Bank calculations.

(a) Mortgage debt from the 1995 and 2000 BHPS surveys refers to mortgage debt that mortgagors have on all property they own. Data from the 2005 and 2006 NMG surveys refer to mortgage debt on primary residence only.

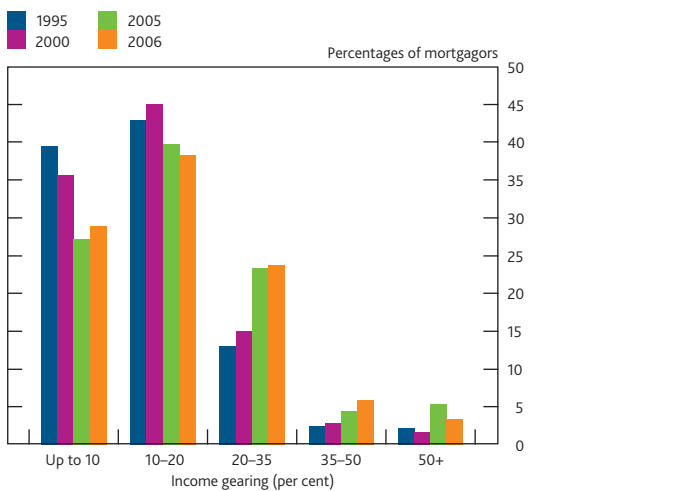
**Chart 6** Distribution of housing equity<sup>(a)</sup>



Sources: BHPS, NMG Research surveys and Bank calculations.

(a) Calculated as value of main home minus mortgage debt. Mortgage debt from the 1995 and 2000 BHPS surveys refers to mortgage debt that mortgagors have on all property they own. Data from the 2005 and 2006 NMG surveys refer to mortgage debt on primary residence only.

**Chart 5** Distribution of mortgage income gearing



Sources: BHPS, NMG Research surveys and Bank calculations.

The greater dispersion of secured debt raises questions about its affordability, especially for those with the most debt. Affordability can be assessed crudely by looking at mortgage income gearing: the proportion of a household's income that is spent on mortgage payments. In recent years, more mortgagors devoted a relatively large share (more than 20%) of their pre-tax incomes to debt service than in 1995 or 2000 (Chart 5).<sup>(1)</sup>

But the current share of household income devoted to debt service is only a crude guide to underlying affordability. What matters more is whether households have the means to repay the debt over their whole lifetime. Of relevance to this is the amount of equity that borrowers have in their homes. In recent years the proportion of mortgagors with a relatively low level of equity in their homes (less than £20,000) was substantially lower than it had been in 1995 or 2000

(Chart 6). At the other end of the distribution, around three quarters of mortgagors had more than £50,000 of equity in their homes.

### Households facing payment difficulties

Evidence on the amount owed and its affordability has been complemented in the survey by asking households directly whether they have problems paying for their debts. As in previous years, all those with unsecured debt were asked whether they found it to be a burden on their household and those with mortgages were asked whether they had experienced problems in paying for their accommodation.

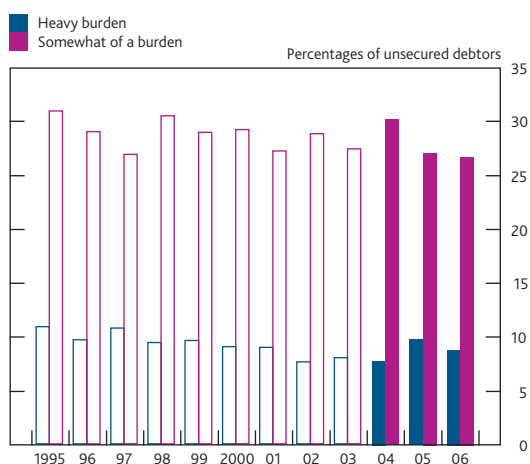
There has been relatively little change since 1995 in the proportion of households saying that their unsecured debt is a burden. Around one in ten households with unsecured debts found them a heavy burden, and around one in four found them somewhat of a burden (Chart 7). Unsecured debts were more likely to be considered a problem by renters than homeowners.<sup>(2)</sup> As might be expected, households for whom their debt is a burden had more debt than those for whom their debt was not a problem.<sup>(3)</sup> They also had lower income.<sup>(4)</sup> Overall, the income of households for whom their unsecured debt is a heavy burden accounted for less than 5% of the total income of all households. So any impact that

(1) Econometric evidence suggests that mortgage payment problems become more likely at high levels of mortgage income gearing (May and Tudela (2005)).

(2) 15% of renters with debt said their unsecured debt was a heavy burden compared with 5% of homeowners.

(3) For homeowners, the average unsecured debt of those who said it was a heavy burden was £13,451 against £8,257 for those who said it was somewhat of a burden and £3,862 for those who said it was not a problem. The equivalent figures for renters were £5,150 for those who said it was a heavy burden, £4,452 for those who said it was somewhat of a burden and £3,178 for those who said it was not a problem.

(4) The average income of those who said their unsecured debt was a heavy burden was £23,932 against £26,550 for those who said it was somewhat of a burden and £32,178 for those who said it was not a problem.

**Chart 7** Burden of unsecured debt<sup>(a)</sup>

Sources: Figures up to 2003 calculated using the BHPS; 2004, 2005 and 2006 figures taken from the NMG Research survey.

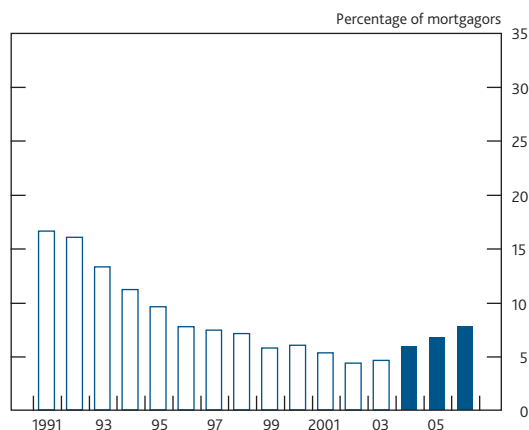
(a) Question: To what extent is the repayment of these loans and the interest a financial burden on your household?

these problems might have had on aggregate spending is likely to have been small.

The relative constancy since 1995 in the proportion of debtors saying their unsecured debt is a burden contrasts with the sharp rise in the proportion of households becoming insolvent over this period.<sup>(1)</sup> One way of reconciling these trends is to note that out of a thousand adults in England and Wales only around two became insolvent in the past year, whereas on the basis of the NMG Research survey about 40 would say that their unsecured debt is a heavy burden. This suggests that the intensification of debt problems at the very extreme of the debt distribution, revealed by higher insolvencies, is not indicative of greater financial stress for the majority of the population.

The proportion of mortgagors who reported problems paying for their accommodation remained low at 7.7%. This was slightly up on a year earlier (Chart 8) consistent with evidence from the Council of Mortgage Lenders showing a small increase in mortgages in arrears and mortgage possessions since the first half of 2004. As with unsecured debt, households who experience problems paying for their mortgages tend to have more debt than those who do not have problems.<sup>(2)</sup> But they also have lower incomes, accounting for less than 4% of the total income of all households in the survey.<sup>(3)</sup> As such, any impact that these problems might have had on aggregate consumer spending is likely to have been muted.

In addition to questions about the burden of unsecured debt and mortgage payment problems, a new question was introduced into this year's survey that asked 'Do you ever have problems repaying your debts?'. Around 87% of homeowners and 76% of renters said they never have any problems paying their debts (Table B).<sup>(4)</sup> About 6% of households said they had problems paying their debts most or every month.

**Chart 8** Mortgage payment problems<sup>(a)</sup>

Sources: Figures up to 2003 calculated using the BHPS; 2004, 2005 and 2006 figures taken from the NMG Research survey.

(a) Question: Many people these days are finding it difficult to keep up with their housing payments. In the last twelve months would you say you have had any difficulties paying for your accommodation?

**Table B** Frequency of debt payment problems<sup>(a)(b)</sup>

Per cent	Frequency of debt payment problems			
	Never	Occasionally	Most months	Every month
Whole sample	83	10	3	3
Homeowners	87	8	3	3
Renters	76	15	5	4

Source: NMG Research survey.

(a) Question: Do you ever have problems repaying your debts?  
(b) Figures may not sum to 100 due to rounding.

Those respondents who said that they had ever had problems paying for their debts were asked what had caused them. The two most frequent reasons given were 'lack of cash flow that has been/will be resolved in the future', and 'overspending' (Table C). Other factors, representing shocks to household circumstances, like higher-than-expected household bills, unemployment, divorce and illness were much less important. It would appear from this that most households perceived their debt problems as either temporary or arising from their own choices.

## Effects of debt problems

Households who said that they had problems repaying their debts were asked what actions they would consider taking to resolve them. The responses are shown in Table D. Almost

- (1) The vast majority of debt in insolvency cases is unsecured. See footnote 2 on page 398.
- (2) The average debt (secured and unsecured) of those reporting mortgage payment problems is £92,970 against £73,648 who report no problems.
- (3) The average income of those reporting mortgage payment problems is £29,770 against £38,820 who report no problems.
- (4) There is a high, but not complete, overlap between those households who said that they have never experienced debt problems, households who said that their unsecured debt is not a burden, and those that do not have problems paying for their mortgage. The proportion of households with no debt problems of any kind is 80% for homeowners and 68% for renters.

**Table C** Reasons for debt problem<sup>(a)(b)</sup>

	Percentage that mentioned
Lack of cash that has been or will be resolved in the future	32
Overspending	29
Higher-than-expected household bills	13
Unemployment	10
Loss of income through reduction or cessation of overtime	10
Illness	6
Credit card and other loan offers were too tempting	4
Children's school or university fees	4
Divorce or separation	4
You or your partner leaving work to have a child	4
Redundancy	2
Debt legacy from being a student	2
Other	6
Don't know	10

Sources: NMG Research survey and Bank calculations.

(a) Question: What are the main reasons for the problems you have in repaying your debts?  
 (b) Households were permitted to make multiple responses so figures do not add up to 100.

**Table D** Action to resolve debt problem<sup>(a)</sup>

	Percentage that mentioned
Cut back on spending	60
Take out another loan	5
Take out another mortgage on your house	4
Declare yourself insolvent (ie bankruptcy or IVA)	3
Sell your house	2
Other	6
None of these	20

Source: NMG Research survey.

(a) Question: What action would you consider taking to resolve your debt problems?

60% said that they would cut back spending. This dominates all other possible responses with only 3% considering bankruptcy or an Individual Voluntary Arrangement (IVA).<sup>(1)</sup>

While borrowers may respond to their own debt problems, lenders may also react to debt problems among their customers. For the first time, this year's survey included questions on whether households felt themselves to be constrained in the amount that they could borrow. The questions covered both *perceived* constraints that discouraged households from applying for credit, and *actual* constraints where the household was prevented from borrowing either by the unavailability of credit or its high price.

**Table E** shows that about 16% of respondents claimed to be facing a perceived or actual credit constraint. On average, those who were constrained had higher existing unsecured debt than those who were not. This suggests that they might have reached a credit limit. They also tended to be young and living in rented accommodation: around one third of renters aged 18–34 said that they were facing a credit constraint.

These questions were not asked in previous surveys. So to get a sense of whether conditions had changed, respondents were asked whether they found it easier or harder to borrow to finance spending than a year earlier. The answers were fairly evenly split: 26% said it was easier, 19% said it was harder and the rest either thought lending conditions had not changed or did not answer. But the responses were not random. Just over 40% of those who found it harder to get credit were themselves now credit constrained. This accounts for 8% of households as a whole.<sup>(2)</sup>

**Table E** Credit constraints and unsecured debt<sup>(a)</sup>

	Share in survey population	Mean unsecured debt	Share of unsecured debt	Easier to get credit	Harder to get credit
Unconstrained	84	1,595	59	82	57
Constrained	16	5,349	41	18	43

Sources: NMG Research survey and Bank calculations.

(a) Questions: Have you been put off spending because you are concerned that you will not be able to get further credit when you need it, say because you are close to your credit limit or you think your loan application would be turned down? Have you found it easier or harder to borrow to finance spending than a year ago? Would you like to borrow any more at the moment but find it too expensive or difficult to do so?

## Bankruptcy

When asked whether they would consider bankruptcy if they were unable to keep up with their debt payments, 7% of all households said that they would seriously consider it and 5% that they might possibly consider it (**Table F**). These proportions are little changed from last year and suggest that the vast majority of households would not consider bankruptcy as a way of alleviating debt problems. Only around 3% of households identified as having debt payment problems said they were considering bankruptcy or an IVA to resolve it (**Table D**). This is a very small proportion of households as a whole. But there is some evidence that attitudes to bankruptcy are not independent of how much

**Table F** Attitudes towards bankruptcy<sup>(a)(b)</sup>

	Percentages of households				
	Whole sample	Homeowners	Renters	Knows a bankrupt person	Does not know a bankrupt person
I would never consider it	54	57	49	43	58
I would only consider it as a last resort	34	35	32	43	31
I might possibly consider it	5	3	8	6	5
I would seriously consider it	7	5	11	9	6

Sources: NMG Research survey and Bank calculations.

(a) Questions: If you were unable to keep up to date with your debt, which of the following statements best describes your views on personal bankruptcy? Do you personally know anyone who has become bankrupt?  
 (b) Figures may not sum to 100 due to rounding.

(1) IVAs are an alternative to bankruptcy, where creditors accept an arrangement for the debtor to follow a specified repayment plan.  
 (2) Among those renters who found it harder to get credit 55% reported being constrained. This accounts for 4% of households as a whole.

debt is owed by the respondent or their housing collateral. Renters are more likely to consider bankruptcy than homeowners, while homeowners are more likely to consider bankruptcy the more unsecured debt they owe.

Another issue is whether the rise in bankruptcy changes the attitudes of others to its rise: could the stigma of bankruptcy be reduced as it becomes more common? The survey reveals that the proportion of people who know somebody who has become bankrupt has risen over the past year from 21% to 24% of the population — suggesting that almost a quarter of the population now know someone who has become bankrupt. Moreover, those who know a bankrupt person are somewhat more inclined to consider bankruptcy themselves. That is consistent with the idea that a rising bankruptcy rate softens attitudes towards it. But it may also arise simply because those who are more likely to become bankrupt have similar characteristics (age, region, housing tenure) and so are more likely to know each other.

## Pensions

Most of the survey is focused on how households cope with their debts. A similar issue concerns how they would respond if their pension turns out not to be as much as had been planned. The responses of different age groups to this question are shown in **Table G**. There did not seem to be any pattern between the age of the respondent and the response. A large fraction of respondents of all ages said they did not know what they would do. Of those who did, responses were fairly evenly split between those who said they would cut spending (or increase saving), those who would put off retiring, and those who would move to smaller or cheaper homes.

**Table G** Response to lower-than-expected pension by age<sup>(a)(b)</sup>

Percentages of households not yet retired						
	18–24	25–34	35–44	45–54	55–64	65+ <sup>(c)</sup>
Increase saving/cut spending	33	37	27	23	30	18
Put off retiring	15	12	18	15	20	36
Move to smaller or cheaper home	13	19	27	24	19	0
Other	1	2	5	6	5	2
Don't know	38	30	23	32	25	44

Sources: NMG Research survey and Bank calculations.

(a) Question: If, between now and when you currently plan to retire, you find that the value of your savings or private pension is not as much as you had planned, how do you think you would be most likely to respond?

(b) Figures may not sum to 100 due to rounding.

(c) The number of respondents who were aged 65 or over but had not yet retired was 13, so these figures may be unreliable.

## Summary and conclusions

The latest survey provides a guide to the extent of debt problems in the household sector as a whole, updating analysis from previous years. As in previous years, almost all (96%) of the reported debt was owed by mortgagors.

The vast majority of mortgagors appeared to be comfortable with their debts. The size of the typical housing equity buffer was higher than at any time since the mid-1990s. Only around 10% of mortgagors had less than £20,000 of equity in their home. While the proportion of mortgagors reporting problems paying for their accommodation remained low, it had increased over the past year to about 8%. Nevertheless, the affected households account for less than 4% of the total income reported in the survey. As such, these problems are unlikely to have large implications for monetary policy because any effect that they might have had on aggregate consumer spending is likely to have been relatively small.

Similarly, the implications for monetary policy of the financial problems faced by indebted renters will also be small. These households appear to have had the greatest problems, both in getting access to credit and in servicing it. They account for a large share of insolvencies, but only a small proportion of total income. Their difficulties reflect both their lower incomes on average and the fact that they did not own homes that could act as collateral for loans. The majority of renters (56%) did not have any unsecured debt. But for those renters who did have unsecured debt, some were experiencing problems in servicing it.

Most of those who reported problems repaying their debts said that this was because of temporary cash-flow problems or because of overspending. Most expected to resolve their debt problems by cutting spending. Bankruptcy was seen as a last resort by most respondents, although those with high debt and those who knew somebody who had become bankrupt were a little more likely to consider it as a way of resolving their debt problems than those who did not.

## Survey method

The survey was undertaken by adding 22 questions to the monthly omnibus survey, MarketMinder, carried out by NMG Research. Interviews were conducted in the respondents' homes using Computer Assisted Personal Interviewing (CAPI). Altogether 1,844 people were interviewed between 24 and 30 September 2006.

One of the limitations of all surveys about sensitive issues such as household finances is that some people may be reluctant to discuss them in face-to-face interviews. Because of embarrassment, those who face the most financial stress might be more likely than others to refuse to answer certain questions or to understate their difficulties.<sup>(1)</sup> As in previous years, the survey was designed to reduce these possibilities. In order to encourage respondents to divulge sensitive information, they were told that the survey was being carried out on behalf of the Bank of England and would be useful in assessing how spending might be affected by its interest rate decisions and in judging the risks to financial stability. They were assured that their replies would be treated in the strictest confidence, would not be passed to any third party at any stage in the future and would not under any circumstances be used for sales or marketing purposes. Also, to avoid embarrassment in revealing sensitive information to the interviewer, replies to questions were coded and recorded in such a way that the interviewer would not know the content of respondents answers.

Response rates were similar to those obtained in previous years. Only those respondents who were the chief income earner or main shopper were asked for their income. This meant that 10% of respondents were not asked about their

income. A further 32% of households refused to provide their household income and 11% did not know what it was.

About 17% of respondents refused to say whether their households had any unsecured debt and a further 5% did not know. Of those known to have unsecured debt, almost 9% refused to say how much they had, while 9% did not know. There was a large overlap between those households who refused to provide information about their income and their unsecured debt. There was greater openness and awareness about secured debt. Only 3% of those asked did not know how much they owed and only 4% refused to say how much.

Several possible approaches can be used to adjust for missing values arising from non-response to particular survey questions. Effectively, these all involve imputing a value for missing observations.<sup>(2)</sup> All calculations reported in this article have been carried out ignoring non-responses. This implicitly assumes that non-responses are distributed in the same way as recorded responses. But non-response for individual survey questions is not distributed uniformly across groups in the survey population. For example, internal Bank research on the 2004 NMG Research survey shows that men, and people from the AB social group, are more likely to refuse to say whether they have any unsecured debt. Ignoring this biases downwards estimates of the proportion of the population with unsecured debt and the overall amount owed. Nevertheless, internal analysis shows that the overall conclusions from the survey are not sensitive to which of the available imputation methods is used.

(1) There is a large literature on the psychology of survey responses. See for example Tourangeau *et al* (2000).

(2) The most common imputation methods are mean imputation, hot decking, multiple imputation and regression-based approaches. See Little and Rubin (2002) for further details.

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# Measuring market sector activity in the United Kingdom

By Rohan Churm, Sylaja Srinivasan and Ryland Thomas of the Bank's Monetary Analysis Division, and Sanjiv Mahajan, Fenella Maitland-Smith and Geoff Tily of the Office for National Statistics (ONS).

A measure of private or market sector activity is useful for assessing demand pressures and productivity trends in the economy. This article discusses the practical issues involved in constructing a measure of the market sector's gross value added (MSGVA) for the United Kingdom. It looks at the existing estimates currently constructed by the ONS and the Bank of England using National Accounts data, and discusses how the Bank of England uses these estimates when analysing demand pressures in the economy.

## Introduction

Macroeconomic analysis typically focuses on the headline measure of activity in the economy, namely gross domestic product (GDP). GDP reflects the contribution, or 'gross value added', of both the private and public sectors to the production of final goods and services in the United Kingdom. But for certain purposes the contribution of the private or market sector alone may also be of interest. For example, when making productivity comparisons across countries it is common to look at trends in the market sector of the economy. That is because these trends are likely to be a better reflection of the relative degree of competitiveness in international trade between countries. A previous *Quarterly Bulletin* article<sup>(1)</sup> also noted that private sector value added is an important input into the calculation of the total demand for resources in the economy, which is likely to be a more appropriate indicator of demand pressures than GDP.

This article discusses the issues that arise when attempting to measure activity in the private or market sector of the economy, within the current System of National Accounts in the United Kingdom.<sup>(2)</sup> It presents the estimates that are currently constructed by the ONS and the Bank of England using National Accounts data. Currently these estimates are experimental, but in the longer term it is intended that they will become regular outputs of the *Quarterly National Accounts* process.

## The usefulness of 'market' sector activity in a macroeconomic context

There are a number of different ways of measuring the output or economic activity of an economy. For the purposes of

macroeconomic analysis and, in particular, the analysis of the determination of inflation, it is useful to appeal to theory for a guide to the relevance of different measures of activity.

The inflation target in the United Kingdom is for the consumer prices index (CPI), which is a basket of marketed goods and services. The prices of marketed goods and services in the economy are set by the companies that produce them. These companies sell their goods and services in (imperfectly competitive) markets, at prices that maximise profits, given the demand curve that they face. Final goods and services are ultimately bought by households, the government and by companies themselves for investment purposes, as well as being sold as exports overseas. The government and households themselves may produce their own 'output'. But this output typically does not involve an exchange of goods or services at a market price, either because it is for own consumption (eg housework, childcare) or because it is usually supplied free at the point of delivery (eg public services such as health and education).

This suggests a particular definition of 'output' that is directly relevant for price-setting firms, namely output that is sold at a market-determined price. This suggests that it is strictly a measure of 'market' or 'business' sector output rather than 'private' sector output that is the appropriate concept, even though these terms are often used interchangeably. This distinction is discussed further in the next section.

The focus on market sector output does not mean that activity in non-market sectors like public services has no impact on

(1) Hills *et al* (2005).

(2) The current System of National Accounts in the United Kingdom is based on the European System of Accounts 1995 (ESA95) standard. This, in turn, is based on the international 1993 System of National Accounts (SNA93, see ONS (1998)) standard.



inflationary pressure in the economy. As discussed in Hills *et al* (2005), government spending will affect inflationary pressure in the economy through two channels. First, the government purchases goods and services directly from firms that operate in the market sector — often referred to as procurement spending. So government procurement has a direct impact on the demand for market sector output. Second, the government also uses factors of production (most notably labour inputs) that could otherwise have been used to produce market goods and services. So there is an 'opportunity cost' associated with the government's use of factors of production.<sup>(1)</sup>

Hills *et al* (2005) show that, in this context, an appropriate measure of aggregate demand pressures in the economy, requires that the total demand for market sector output be added to the opportunity cost of the factors of production used by the government. This measure of aggregate demand is referred to as 'the aggregate demand for resources'. In order to measure the opportunity cost of the factor inputs used by the government, measures of market sector productivity are required, which in turn require estimates of market sector output. So the ability to estimate market sector activity is important in constructing appropriate measures of aggregate demand in the economy.

## Defining and deriving market sector output using the National Accounts

How can market sector output be measured in practice? The natural data source is the National Accounts, which provides an integrated system of income, production and expenditure accounts for the various sectors, industries and products in the economy.

The current headline measure of activity in the UK economy is GDP measured at market prices. But when considering the aggregate contribution of all the different industries and sectors to the output of the economy, the more appropriate measure of activity is GDP measured at basic prices, often referred to as gross value added (GVA). This measure excludes the value of taxes (less subsidies) on products<sup>(2)</sup> from GDP measured at market prices. Including these taxes in the valuation of the output of a particular industry or sector may be a misleading guide to their contribution to economic activity.

GVA is calculated, in current price terms, as the sum of each sector's or industry's gross value added,<sup>(3)</sup> using what is called the production approach. So a simple method of constructing market sector GVA (MSGVA) would be to add up the gross value added of those sectors that constitute the market sector of the economy. Or, equivalently, we could start with GVA for the whole economy, and then exclude the gross value added of

the sectors that make up the non-market sectors. In other words:

$$\begin{aligned} \text{MSGVA} &= \text{Sum of gross value added of the} \\ &\quad \text{'market' sectors} \\ &= \text{GVA at basic prices for the whole economy} \\ &\quad \text{less} \\ &\quad \text{gross value added of the 'non-market' sectors.} \end{aligned}$$

There are a number of practical issues that need to be addressed before applying this approach. The key issue is to define the market and non-market sectors of the economy. The 1993 System of National Accounts (SNA93) provides clear definitions of market sector activity. It defines market output as output that is disposed of, or intended to be disposed of, on the market, or on which an economically 'significant' price is charged that influences the supply of and demand for that output. A detailed analysis of how this definition is applied in practice in the United Kingdom is provided by Mahajan (2006), together with examples of different activities in the United Kingdom that constitute market and non-market sector output. But no single definition of market sector output is likely to meet every need or be appropriate to answer every question. So there are some instances, discussed below, in which users might want to employ something other than the SNA93 definition. In particular, there are a number of practical issues raised by the SNA93 definition of market sector activity:

- First, it is important not to equate the non-market sector with the definition of the 'public sector' in the SNA93. The public sector consists of the general government sector (central and local government) and public corporations.<sup>(4)</sup> Public corporations' output is treated as market output in the National Accounts. This is because public corporations do have some degree of financial autonomy from central and local government, and typically charge prices that are at least partly motivated by market conditions. The size of this sector has fallen over time, reflecting the privatisation of many businesses, especially during the 1980s and 1990s. So their inclusion in the definition of market sector GVA is helpful when analysing trends in activity over longer horizons, as it avoids arbitrary shifts in the historical time series resulting from the reclassification effects of individual privatisations.<sup>(5)</sup>
- Second, some bodies in the general government sector also produce marketed output (eg sports facilities, car parking

(1) Hills *et al* (2005) also discuss some other channels through which government activity might affect both the demand for and the supply of market sector goods and services over the longer term.

(2) For example VAT and excise duties.

(3) The gross value added of a sector or industry is simply the value of the output of that sector less the value of goods and services (including imported goods and services) that are used as intermediate inputs to produce that output.

(4) See [www.statistics.gov.uk/downloads/theme\\_economy/MA23.xls](http://www.statistics.gov.uk/downloads/theme_economy/MA23.xls) for examples.

(5) A complete list of privatisations between 1979 and the mid-1990s is available in ONS (2006).

fees).<sup>(1)</sup> So, it would not necessarily be desirable to exclude all of the central and local government sectors' gross value added when defining market sector GVA. In practice, the market output of the general government sector is relatively small — in current prices, market output generated by general government in 2004 accounted for 8.2% of total output produced by this sector.

- Third, there are also bodies outside the public sector, eg charities and universities, that produce non-market output that is not sold under profit-maximising conditions or at market-determined prices. These bodies are included in the non-profit institutions serving households (NPISH) sector in the National Accounts. So the non-market output of this sector should be excluded. The NPISH sector also produces market output; in 2004 this accounted for 22.3% of the sector's total output. One problem is that a full set of accounts for the NPISH sector is not presently available in the United Kingdom, although it is treated as a distinct sector in the current SNA93.
- Fourth, the role of housing services in market sector activity needs to be carefully considered. Both consumption spending and GDP in the National Accounts include household spending on the renting of dwellings and an imputed amount of 'rental spending' by owner-occupiers. Actual expenditure on rentals represents payments on marketed housing services, so in the SNA93 it is treated as market sector activity. However, owner-occupiers are assumed to consume their own output of housing services that they 'produce' from their ownership of dwellings. So imputed rentals might be excluded from the definition of market sector output, given that this is a form of output for 'own consumption'.

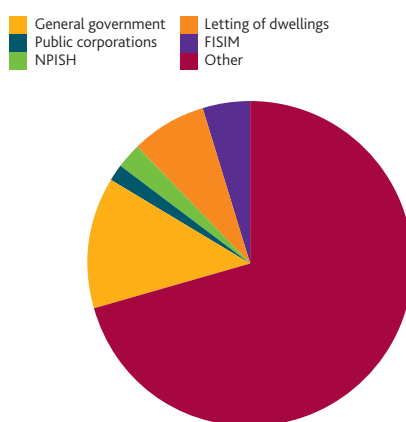
But one of the reasons for including imputed rentals as a form of final expenditure and output in the National Accounts is to ensure that there are no effects on GDP arising from shifts between renting and owner-occupancy, for a given level of housing services or stock of dwellings in the economy. It also facilitates comparisons of GDP across countries that have different degrees of owner-occupancy. So excluding just the imputed rentals of owner-occupiers from the definition of MSGVA might potentially reintroduce problems that their original inclusion in GDP was meant to solve, for example when analysing movements in activity over periods when the degree of owner-occupancy is changing. For this reason, the Bank also looks at a measure of market sector output that excludes both actual and imputed rental spending to give a measure of market sector gross value added excluding all housing services.<sup>(2)</sup>

- Finally, the role of Financial Intermediation Services Indirectly Measured (FISIM) must be considered. This is discussed in more detail in Mahajan (2006). The value of

these services is not, at present, allocated across the market and non-market sectors. Neither are they currently allocated between final consumers of these services and those who are implicitly purchasing them as an input into production. So a decision has to be made about whether to adjust MSGVA by the same amount as GDP is currently adjusted for these services.

Chart 1 summarises the importance of the various sectors and components discussed above in terms of their contribution to whole-economy GVA.

**Chart 1** Contributions of sectors and components to total gross value added<sup>(a)</sup> in 2004



(a) Whole-economy GVA plus the FISIM adjustment.

## Approaches to estimation

Like GDP, different measures of market sector GVA can, in principle, be constructed using an expenditure, production or income approach. And, also like GDP, there is interest in measuring market sector GVA in both nominal (current price) and real (chained-volume) terms and at a quarterly frequency. In principle, the expenditure, production and income approaches should deliver the same estimate in both nominal and real terms. But in practice, like all statistical estimates, there are errors and omissions, which mean that in general the three approaches yield different results. So there is a need to reconcile or 'balance' estimates derived from the three approaches.

As discussed earlier, there are also two different perspectives from which MSGVA estimates can be derived:

(1) A detailed list is provided in Mahajan (2006).

(2) There are also some other reasons why the Bank of England looks at a measure that removes both actual and imputed rental spending. One issue is that flows of housing services arguably do not represent a claim on scarce resources since they require little or no primary factor inputs (ie non-housing capital and labour inputs) to produce, but are rather the flow of services arising from the existing stock of dwellings. This is the approach taken in the Bank's quarterly forecasting model, where output is defined to exclude housing services, see Harrison *et al* (2005). Also, in traditional productivity analysis, which typically compares output growth to primary input growth, housing services are often excluded from the measure of output (see Oulton and Srinivasan (2005)).

- 'Bottom-up' estimates, based on identifying and aggregating together the market components of all the different industries, products and sectors in the economy.
- 'Top-down' estimates, based on removing identifiable components of non-market sector activity from existing estimates of whole-economy activity.

The bottom-up approach is likely to be the more reliable of the two methods in practice, given that it identifies all the relationships between the different industries, sectors and products in the economy. Top-down estimates are likely to be simpler to construct, but inevitably involve some simplifying assumptions and approximations that mean it is harder to achieve balanced estimates across the income, expenditure and production approaches.

The main advantage of the bottom-up approach is that it identifies the different goods and services being supplied as a result of market sector production, and analyses the demand for those market goods and services by different sectors and industries. Comparing the estimates of supply and demand for market goods and services in this way should, in theory, produce the most robust final estimate of MSGVA; and it should also provide a more reliable allocation and breakdown of MSGVA into the different components on the income, expenditure and production side of the National Accounts. This is the same principle by which GDP is estimated using the three approaches.

For both GDP and MSGVA, a fully balanced bottom-up analysis, in both nominal and real terms, is best done using the Input-Output Supply and Use Tables framework (see ONS (1998) and ONS (2006)). The box on page 408 discusses how, in principle, this framework should be applied to the estimation of MSGVA.

However, it is not currently feasible to achieve fully balanced quarterly estimates of market sector GVA, in either current price or real (chained-volume) terms, using this bottom-up approach. Later in this article, some of the problems that would need to be resolved to use the bottom-up approach are discussed, as well as the various steps in train to address them. Before that, the article outlines the more approximate bottom-up and top-down methods that are currently available for estimating MSGVA.

### Annual current price estimates of market sector GVA from the Input-Output Supply and Use Tables 1992–2004

Each year the ONS publishes detailed information and statistics covering the UK economy in the Input-Output Annual Supply and Use Tables. These tables are chiefly used to construct balanced estimates of GDP in current price terms by combining information from the income, expenditure and

production sides of the National Accounts. But it is possible to use these tables to separate out market sector activity in current prices over the period 1992 to 2004. Mahajan's (2006) analysis of market sector and non-market sector activity is in accord with the 1995 European System of Accounts (ESA95), and provides details and estimates of market output produced by the non-market sectors.

The key shortcoming of these data is that they are annual and in current price terms. And the latest available estimates are for 2004. This limits their use in current policy analysis where timely quarterly volume estimates are also required. But these current price estimates are still important as they are needed to provide the annual weights for chain-linked volume estimates of market sector GVA.

### Chain-linked volume measures of market sector GVA using a bottom-up production approach

As discussed earlier, on the production (output) side of the National Accounts, a current price measure of GVA can be estimated by adding up the gross value added of all the different industries in the economy. Similarly, a chained-volume index of GVA at basic prices — sometimes referred to as GDP(O) or GDP(P) — is constructed by weighting together the volume of output of all the different industries.<sup>(1)</sup> So to construct a chained-volume measure of MSGVA from the production (output) side of the accounts — MSGVA(P) — it is possible to aggregate, from a bottom-up basis, all of the components of GVA excluding output that can clearly be attributed to non-market activity.

A new experimental National Accounts aggregate was introduced by the ONS in 2005 that uses this approach to construct quarterly estimates of market sector GVA in chained-volume terms.<sup>(2)</sup> Prior to 2005, it was possible to calculate an approximate top-down estimate of market sector GVA by excluding the output contribution of three industry groups — Education, Health and social work, and Public administration and defence. But, although these industries are dominated by the public sector and largely produce non-market output, the bottom-up method introduced by the ONS in 2005 is more accurate. That is because this approach is carried out at a low level of aggregation and so it is possible to remove just the central and local government components of the health and education sectors, along with other non-market output such as sewage and refuse disposal and museum activities. However at present it is not possible to identify the

(1) See Table 2.4 in the *Blue Book*, [www.statistics.gov.uk/statbase/Product.asp?vlnk=1143](http://www.statistics.gov.uk/statbase/Product.asp?vlnk=1143), and Tables B1 and B2 of the *Quarterly National Accounts* release, [www.statistics.gov.uk/statbase/Product.asp?vlnk=818](http://www.statistics.gov.uk/statbase/Product.asp?vlnk=818). GDP(P) is essentially an aggregate annually chain-weighted Laspyeres index, where the output indices of all the industries in the economy are weighted together using current price industry value added shares in the previous calendar year.

(2) See Herbert and Pike (2005).

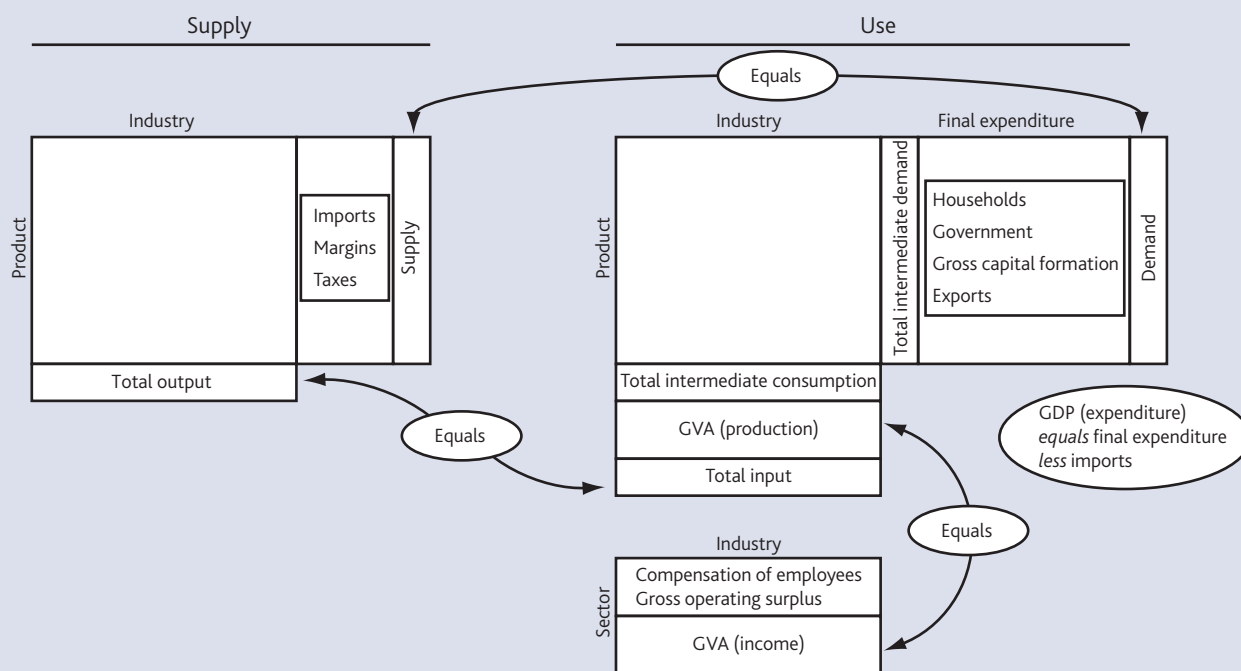
## An Input-Output Supply and Use Tables approach

The Input-Output Supply and Use Tables consist of two matrices, which bring together the production, income and expenditure measures of GDP, integrating the components of GVA, inputs, outputs and final demands. These tables show the supply and demand for products in terms of 123 industries (represented by columns in the tables) and 123 products (represented by rows). The Supply Table shows the output of each industry by type of product as well as showing imports of goods and services separately. The industrial dimension of the Use Table shows, for each industry, the costs of intermediate inputs of goods and services incurred in the production process (known as intermediate consumption) along with the costs of primary inputs such as labour costs and profits (which constitute the GVA of each industry). The product dimension of the Use Table shows both the intermediate demand and

final demand for each product and, includes goods and services both domestically produced and imported. These tables are represented in **Diagram A**.

In terms of applying this approach to the market sector, these tables would show the market sector and non-market sector industries and products separately, including a breakdown of imports from overseas. With these additional rows and columns, the supply and demand for market sector products can be balanced and analysed separately from the non-market sector industries and products. The ONS has only compiled such analyses in current prices — for example, Input-Output Supply and Use Tables, where imports of goods and services are included within the consumption estimates, and Input-Output Analytical Tables, where direct and indirect imports have been separated out. The ONS is investigating the feasibility of incorporating this level of detail in its new Input-Output Supply and Use Tables system currently under development.

Diagram A Balancing annual (I-O) Supply and Use Tables



non-market output of the NPISH sector. So this component is not currently removed and as a result this is still an approximate measure of MSGVA.

A number of variants are produced by the ONS that reflect some of the different uses to which estimates of MSGVA are put. As discussed earlier, one variant excludes actual and imputed rentals. A non-oil measure of MSGVA is also produced that HM Treasury uses to help assess the size of the output gap.<sup>(1)</sup> The ONS publish these estimates each quarter in experimental data releases, available at the same time as

the *Output, Income and Expenditure (OIE)* and *Quarterly National Accounts (QNA)* data releases.<sup>(2)</sup>

### Current price and chain-linked volume measures using a top-down expenditure approach

Bank staff have also constructed quarterly current price and volume measures of market sector GVA based on the expenditure side of the accounts — MSGVA(E). This facilitates

(1) See HM Treasury (2005).  
 (2) See [www.statistics.gov.uk/statbase/Product.asp?vlnk=14065](http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14065).

the analysis of demand pressures on market sector producers broken down in terms of the different components of expenditure. This measure is only approximate in current price terms, as it is not possible to estimate all of the required expenditure-based components on an annual, let alone a quarterly, basis (for example, the quantity of market output produced by the general government sector is only available annually up to 2004).

The box on page 412 discusses the basic arithmetic of this approach in terms of conventional National Accounts identities. Essentially it is a top-down estimate that starts with GDP from the expenditure side (GDP(E)) and then removes general government gross value added from general government final consumption expenditure. The approximation involved in this top-down method is that the government's demand for market sector output is represented by a measure of 'net' rather than 'gross' procurement, ie it is the government's purchases of market output net of its supply of market output. This measure also excludes the gross value added component of both actual and imputed spending on rentals.

To derive a real, or chained-volume, estimate of market sector GVA from the expenditure perspective, the additional requirement is a price deflator for government procurement so that the measure of net government procurement in current price terms can be converted into a volume measure. The method the Bank uses to construct this deflator is discussed in the box on page 413. The implied volume of government procurement is then combined with the other components of final expenditure using annual chain-linking methodology.

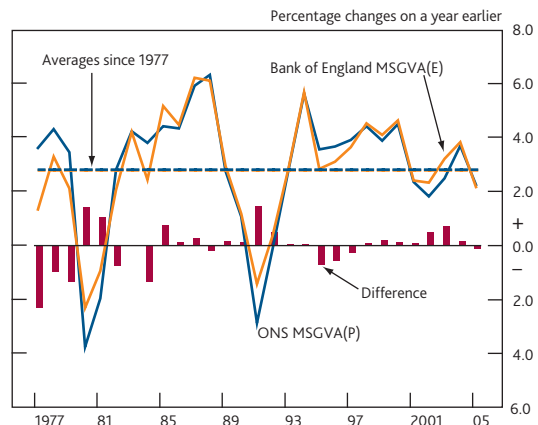
**Table A** summarises the construction of the various approximate measures discussed above.

## What do the estimates of market sector GVA tell us?

### Comparing production and expenditure measures of MSGVA in volume terms

**Chart 2** compares the ONS's experimental estimate of MSGVA, using the production approach (MSGVA(P)), with the Bank's top-down, expenditure-based measure (MSGVA(E)), over the period since the late 1970s. To facilitate this comparison the variant of MSGVA(P) that excludes both actual and imputed rentals is used. Both estimates exhibit a similar pattern over time, and the average growth rates of the two measures are almost identical, over both the whole sample and the past ten years. But there are periods where the estimates of growth from the two methods of calculating market sector output do differ.

**Chart 2** Market sector GVA using Expenditure (E) and Production (P) approaches (excludes actual and imputed rents)



Sources: ONS and Bank calculations.

**Table A** Summary of currently available MSGVA estimates

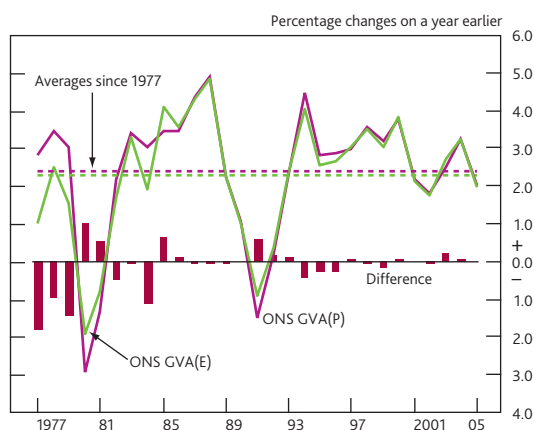
	Current price		Chained-volume measures	
	Input-Output approach <sup>(a)</sup> (ONS)	Expenditure approach <sup>(b)</sup> (Bank)	Production approach <sup>(b)</sup> (ONS)	Expenditure approach <sup>(b)</sup> (Bank)
Frequency	Annual only to 2004	Annual and quarterly	Annual and quarterly	Annual and quarterly
<b>Bottom up</b>				
Bottom up excluding imputed rents	✓	✗	✓	✗
Bottom up excluding actual and imputed rents	✓	✗	✓ (shown in Chart 2)	✗
Bottom up excluding NPISH sector	✓	✗	✗	✗
<b>Top down</b>				
Top down excluding imputed rents	✗	✓	✗	✓
Top down excluding actual and imputed rents	✗	✓	✗	✓ (shown in Chart 2)
Top down excluding NPISH sector	✗	✗	✗	✗

(a) Excluding FISIM adjustment.  
(b) Including FISIM adjustment.

**Chart 2** highlights two key points. First, the match between the MSGVA(E) and MSGVA(P) estimates is remarkably close given all the conceptual issues discussed earlier, and the approximations and different implicit assumptions used in both estimates. Second, there are similar discrepancies between published GDP chain-linked volume estimates, based on the production and expenditure approaches (**Chart 3**). These discrepancies arise from a variety of sources:

- First, components of GDP based on survey data are subject to sampling error; and some components are based on projections and proxies.
- Second, differences between the volume measures of GDP necessitate the use of balancing adjustments which cannot always be accurately allocated to components or industries (and between the market and non-market sectors). In particular in recent years, coherence adjustments have been applied to annual volume estimates of GDP(P) that attempt to keep growth within 0.2 percentage points of the growth of the expenditure-based measure.
- Third, deflation techniques tend to vary in both appropriateness and robustness, and for some components deflators simply do not exist.

**Chart 3** Whole-economy GVA using Expenditure (E) and Production (P) approaches



The close match between the MSGVA estimates could reflect the various sources of discrepancy and approximations cancelling each other out. So there is no guarantee that such estimates will remain close in the future. Nonetheless the estimates in **Chart 2** provide some reassurance that the different approaches adopted by the ONS and Bank staff are broadly sensible and that the estimates are a reasonable guide to growth in market sector activity.

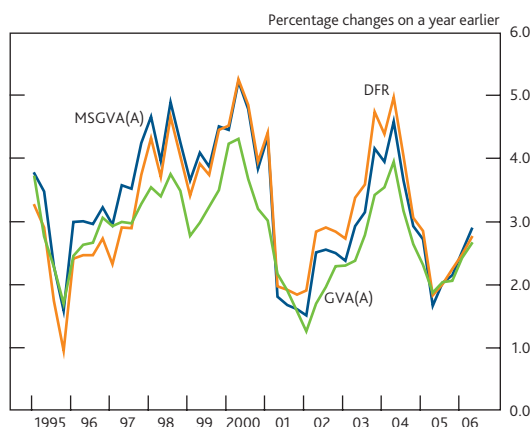
One natural step is to combine the production and expenditure-based estimates to give an 'average' measure of MSGVA, as is currently done for GDP. In the case of GDP, the ONS believes the expenditure method is likely to be a more

reliable indicator of medium and long-term trends in activity, while the production-based measure is likely to be a more reliable short-term indicator of growth, until such time as the National Accounts have been fully balanced in current price terms for these years. So, in a similar vein, Bank staff have created an 'average' measure of market sector GVA, MSGVA(A), where the Bank's top-down expenditure measure is used as the measure of growth in balanced years,<sup>(1)</sup> and the ONS MSGVA(P) production measure for the most recent period of growth.<sup>(2)</sup>

### Comparing MSGVA with GDP and the Demand for Resources

**Chart 4** compares the growth of the average measure of MSGVA with the growth rate of the average measure of whole-economy GVA, and an estimate of the growth rate of the 'Demand for Resources' (DFR) following the method outlined in Hills *et al* (2005).<sup>(3)</sup>

**Chart 4** Market sector GVA, whole-economy GVA (average measures) and the Demand for Resources



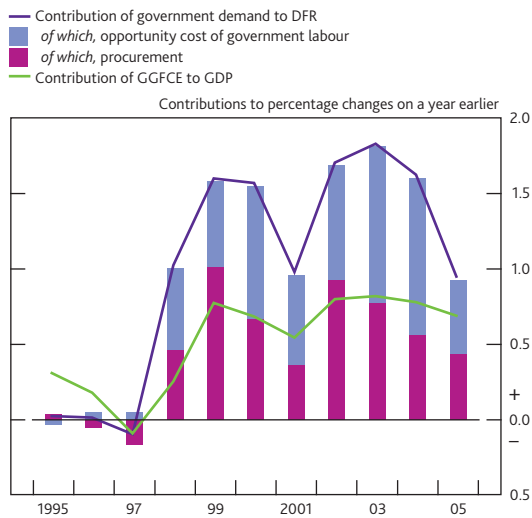
Sources: ONS and Bank calculations.

The average measure of MSGVA has typically grown at a faster rate than that of headline whole-economy GVA for much of the past 30 years (by around 0.4 percentage points a year). This partly reflects, for example, the faster rate of productivity growth in the market sector than that estimated for the non-market sector. Moreover, in the late 1990s and early 2000s the aggregate Demand for Resources grew more rapidly than MSGVA and GVA. As discussed in Hills *et al* (2005), the faster growth rate of the government's demand for inputs of

- (1) Balancing of the accounts via the Input-Output Supply and Use Tables has only been applied to GDP in the years 1989–2004. So prior to this period Bank staff have used the average of the current price income, output and expenditure estimates of GDP to construct the Bank's top-down 'average' MSGVA estimate.
- (2) To achieve an expenditure breakdown of MSGVA over the period when the production measure is used, the Bank of England allocates the residual between the expenditure and production methods to net government procurement.
- (3) This method works out the opportunity cost of government labour by multiplying ONS estimates of general government employment by the average productivity of labour in the market sector. See Hills *et al* (2005) for a discussion of the issues with measuring the opportunity cost in this way. Note here the Bank's MSGVA(A) measure is used to construct the opportunity cost of government labour rather than the ONS MSGVA(P) measure used in Hills *et al* (2005).

labour and marketed goods and services, relative to the growth of its measured outputs, implies that GDP growth estimates over this period are likely to have understated the increase in aggregate demand for scarce resources in the economy. **Chart 5** shows the contribution of government procurement and employment to the growth of the total demand for resources compared with the contribution of general government final consumption expenditure (GGFCE) to GDP growth.

**Chart 5** Contributions of government spending to different measures of activity



More recently, the growth rates of the three measures of activity in **Chart 4** have converged. That reflects a slowing in both government employment growth and real procurement spending, relative to the growth in the volume of government final consumption expenditure.

## Future work

In the longer term, the ONS will be looking to derive its own estimate of MSGVA from the expenditure side of the National Accounts. In the meantime, ongoing initiatives should assist in better estimation of the existing Bank of England measure. In particular, work is under way to improve estimates of government procurement at current prices, and then to develop better deflators in conjunction with other government departments. These data are also required for the modernisation of the National Accounts, which is presently under way. The introduction of a methodology based on constant price Input-Output Supply and Use Tables should also provide a better foundation for the more accurate and coherent measurement of market sector GVA.

## Conclusion

This article has discussed the various issues that arise when constructing a measure of market sector gross value added in the United Kingdom. It has also presented some preliminary estimates that are consistent with the current set of National Accounts. These data are currently experimental but the production estimates are available on the ONS website. Various pieces of work are under way that will improve these estimates over time, such as improvements in the measurement of public sector inputs that form part of the recommendations of the *Atkinson Review*<sup>(1)</sup> which are being taken forward by the UK Centre for the Measurement of Government Activity (UKCeMGA).<sup>(2)</sup> When this work is complete, it is hoped that these estimates will become National Statistics and regular outputs of the *Quarterly National Accounts* process.

(1) See [www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/downloads/Atkinson\\_Report\\_Full.pdf](http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/downloads/Atkinson_Report_Full.pdf).  
 (2) See [www.statistics.gov.uk/ukcemga/](http://www.statistics.gov.uk/ukcemga/).

## Top-down estimates of market sector GVA in current prices using an expenditure approach

GDP measured using the expenditure approach, 'GDP(E)', is given, in current price terms, by the sum of final expenditure in the UK economy plus the value of net trade with the overseas sector. Because these expenditures are measured at market prices, GVA estimated from the expenditure side, is given by removing the basic price adjustment, which is the value of taxes net of subsidies on products. So:

$$\begin{aligned} GVA &= GDP(E) - BPA \\ &= C + I + G + X - M - BPA \end{aligned}$$

where  $C$  is private consumption spending of the household and NPISH sector,  $I$  is total private and public investment spending including changes in inventories (sometimes referred to as stockbuilding),  $G$  is total general government (central and local government) final consumption spending,  $X$  is the value of exports,  $M$  is expenditure on imports and  $BPA$  is the basic price adjustment.

In order to move to an estimate of market sector gross value added excluding housing services (the Bank's preferred measure), it is useful to split up some of the expenditure components. Private consumption can be written as:

$$C = C_X + C_N + C_R$$

where  $C_X$  is household final consumption expenditure excluding rentals,  $C_N$  is NPISH final consumption expenditure and  $C_R$  is the value added component of rentals expenditure.

In addition, both the NPISH and the general government sectors in the National Accounts are assumed to consume their own supply of non-market output. So the value of their final consumption expenditure is equal to the value of the non-market output they produce. In turn, the value of this final output is equal to the value of marketed goods and services bought in to produce that output (known as 'procurement' for the government sector) plus the value of payments to factors of production (ie capital and labour), which is the 'gross value added' by both sectors. Because, by definition, neither the NPISH nor the government sector earns a profit on their non-market output, the value of factor payments by both sectors is simply their labour costs plus an imputed amount of capital stock depreciation. This implies:

$$C_N = C_{NP} + GVA_N$$

$$G = G_p + GVA_G$$

where  $C_{NP}$  is the procurement of marketed goods and services by the NPISH sector,  $G_p$  is procurement by the government sector and  $GVA_N$  and  $GVA_G$  are respectively, the gross value added of the NPISH and general government sectors.

Breaking down the expenditure components in this way allows us to define market sector output,  $MSGVA(E)$ , as the sum of the expenditure components on non-housing private sector goods and services:

$$MSGVA(E) = C_X + I + C_{NP} + G_p + X - M - BPA$$

This is related to GVA by the expression:

$$MSGVA(E) = GVA - GVA_N - GVA_G - C_R$$

So the value of market output in the economy excluding housing services is derived by replacing the household and government final consumption expenditure components of GDP(E) with their expenditure on non-housing marketed goods and services. In turn, this can also be written as GVA minus the gross value added of the NPISH and general government sectors, less the value of rentals expenditure. In practice because estimates of the gross value added of the NPISH sector are unavailable, Bank staff currently remove just the total gross value added of the general government sector and the value of rentals expenditure from GVA:

$$MSGVA(E) = GDP(E) - GVA_G - C_R - BPA$$

$$MSGVA(E) = C_X + C_N + I + G_p + X - M - BPA$$

Throughout, this example has assumed that the government sector produces no marketed output. In practice, some of the gross value added of the government reflects its provision of market goods and services. As discussed in the main text, this means that the measure of procurement here is strictly government purchases of marketed goods and services net of its own provision of them.



## The procurement deflator

One of the main components of market sector GVA, when calculated from the expenditure side of the National Accounts, is government procurement ( $G_p$ ). This represents the marketed goods and services bought in by the government to produce their non-marketed output. Nominal general government procurement is currently available in the *Quarterly National Accounts* and in net terms can be calculated by subtracting government compensation and government gross operating surplus from general government final consumption expenditure. Expenses on compensation and the payment to capital do not reflect payment on goods and services, and are therefore subtracted from nominal government spending to leave nominal government procurement. But, to calculate a chained-volume measure of market sector GVA from the expenditure side (MSGVA(E)), an estimate of real government procurement is required.

The simplest way to calculate real government procurement is to divide nominal government procurement by an appropriate deflator. In general, this deflator will consist of price indices of goods and services that the government buys, weighted together according to the respective shares of the goods and services in nominal procurement. Unfortunately, these data are not currently available. Instead, the Bank currently uses private sector price indices to proxy the prices that the government pays for its goods and services.

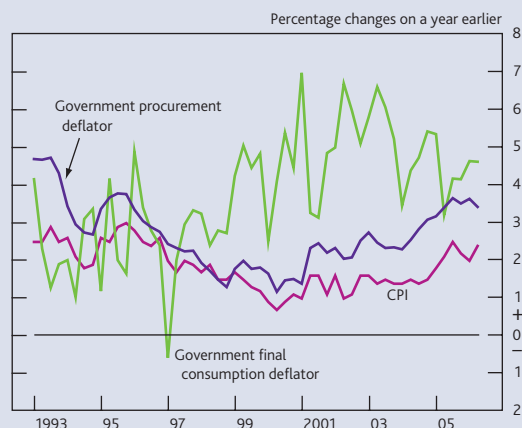
One way of calculating the procurement deflator, using private sector prices, is to take a weighted average of headline producer price inflation and headline CPI services inflation (CPI services), with the weights being the shares of goods and services in nominal procurement. However, this can be improved upon by using detailed information from the ONS Input-Output Supply and Use Tables<sup>(1)</sup> which splits government final consumption expenditure between 123 industry and product groups on an annual basis. These data can be combined with individual industry and product price indices to calculate a more accurate procurement deflator.

Of course, the most accurate deflator, given current data, would ideally link each good and service listed in the Input-Output Supply and Use Tables to its price index and weight it accordingly. However, the linkage between the product and its price is difficult to create because the mapping is not exact. A working approximation is to use product groups in producer price indices (PPIs),<sup>(2)</sup> and split the goods bought by the government between thirteen different PPIs. This is possible from 1997 Q4 onwards: before then, the simpler approach (outlined above) is used.

In theory, it should also be possible to measure the prices of services bought by the government using services producer prices indices (SPPIs), or disaggregated CPI services indices. But the coverage of these data is currently insufficient to do so accurately. Furthermore, CPI data may be misleading where (the price of) services provided to businesses are very different to those provided to consumers. For example, in transport services consumers may tend to travel economy class while many businesses could pay business class fares. In addition, SPPIs are not currently available for many of the services bought by the government (eg legal services). So the Bank of England currently uses the headline CPI services price instead to deflate the services procured by the government.

Chart A shows a government procurement deflator that weights together thirteen PPIs and the CPI services price index. On average, the government procurement deflator has risen by a little over 2% a year since 1996. That is slightly faster than the rate of increase in CPI over the same period, partly reflecting the higher share of services in government procurement. But, over the same period, it has risen more slowly than the government final consumption deflator.

Chart A Government procurement deflator



Sources: ONS and Bank calculations.

(1) For the latest tables see [www.statistics.gov.uk/about/methodology\\_by\\_theme/inputoutput/latestdata.asp](http://www.statistics.gov.uk/about/methodology_by_theme/inputoutput/latestdata.asp).  
 (2) See pages 4 and 5 of the PPI data release, available at [www.statistics.gov.uk/statbase/Product.asp?vlnk=790](http://www.statistics.gov.uk/statbase/Product.asp?vlnk=790).

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# Fundamental inflation uncertainty

## Summary of Working Paper no. 309 Charlotta Groth, Jarkko Jääskelä and Paolo Surico

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The Phillips curve, which relates inflation to some measure of real activity, plays an important role in modern economic theory. The relationship is also important for policymakers, as it serves as a useful description of the short-run inflation dynamics. In modern New Keynesian models, the Phillips curve is explicitly derived from the pricing decisions of firms, that set their prices as a mark-up over costs. At the aggregate level, the baseline New Keynesian Phillips Curve relates current inflation to lagged and expected future inflation, and some measure of real activity, and the coefficients on the different terms will depend on factors such as the degree of pricing power of firms, and how often firms reset their prices.

A large amount of research has focused on assessing the ability of the New Keynesian Phillips Curve (NKPC) to predict a path for inflation that is consistent with the actual data. To test whether the NKPC model is able to predict movements in actual inflation, the model-based measure of inflation is often represented as the present value of current, and expected future, costs. This representation is typically referred to as fundamental inflation. It has been shown that the fundamental inflation predicted by the NKPC tracks actual inflation fairly well using US data. One difficulty with this result, however, is that the assessment of the empirical performance of the model is often qualitative and mainly based on graphical inspection of fundamental and actual inflation. That is, the fit of the model is not evaluated statistically.

In this paper, we note that the fundamental inflation predicted by the NKPC is only a point estimate, and that its measurement is associated with uncertainties. These uncertainties arise since fundamental inflation is derived using estimates of the parameters in the NKPC, and of expectations of future costs. The object of this paper is to supplement the fundamental inflation measure with information on the uncertainties associated with its measurement. We represent these uncertainties in the form of a confidence band around the measure of fundamental inflation. This gives us an upper and a lower limit for fundamental inflation predicted by the NKPC. By inspecting whether actual inflation falls within the bands predicted by the NKPC we can assess whether, in a given period, it is able to account for the movements in actual inflation.

On the empirical side, we present an application of our method to UK and US data. We confirm that the fundamental inflation predicted by the NKPC tracks actual inflation reasonably well for both countries. The UK measure of fundamental inflation uncertainty implies quite a narrow band and suggests that there are a number of periods where the model is not capable of accounting for movements in actual inflation. By contrast, we find that for the United States, fundamental inflation is more uncertain, casting some doubt on the empirical success of the NKPC.

# Returns to equity, investment and $Q$ : evidence from the United Kingdom

## Summary of Working Paper no. 310 Simon Price and Christoph Schleicher

Tobin's  $Q$  is the ratio of the market value of a firm to the value of the firm's capital stock. The simple idea that makes it so attractive is that the larger this ratio the cheaper it is for the firm to increase the capital stock by issuing more equity. So one might expect that investment would be positively related to it, and this can be given a rigorous theoretical explanation. But it is commonly believed that, contrary to this neoclassical theory, Tobin's  $Q$  is of little practical use in explaining aggregate business investment. By contrast, recent evidence suggests that the user cost of capital (effectively, the equivalent to the cost of renting capital) has a statistically significant impact on investment. This is odd, because the theory in both cases is based on the same conditions, those required by firms seeking to maximise their value to shareholders. We do not attempt to resolve this empirical puzzle, but take a different approach to using the information in the data.

The value of a firm can be thought of as the discounted sum of future profits; the present-value.  $Q$  is therefore the ratio of this present-value to the cost of replacing capital. Standard finance theory predicts that because this present-value condition comes from future profits,  $Q$  should contain information about market participants' expectations of future events. The intuitive explanation is that if  $Q$  rises above its long-run average value, this should be an indication that either (i) future investment opportunities are expected to be good or (ii) that future investment is discounted at a lower-than-normal rate (or both). Some recent work on US data suggest that the same present-value condition relates  $Q$  to expected values of several financial variables such as bond yields, the ratio of debt to capital, growth in debt, and stock returns. In this paper we contribute to this debate by employing data using Bank of England estimates of the capital stock of the UK business sector.

The approach implied by standard investment theory strictly requires us to work with a marginal measure (the discounted profits relative to the cost of an extra unit of capital). Unfortunately, this can be proxied by the average (which is much more easy to measure) only under stringent restrictions which are unlikely to hold in practice, and this might explain the lack of success in some previous empirical applications. But the present-value approach employed in this paper relies on a small number of assumptions, and requires only an

average value of  $Q$ . The main condition for the present-value framework to be valid is that average  $Q$  is stationary (meaning that the mean and variance of the variable in question do not tend to change over time). It is quite reasonable, theoretically, to expect this to hold. Using a battery of statistical tests for stationarity, we find evidence that this is the case. Having established this, we then look at the short and long-run relationships between  $Q$  and the variables it might predict, as implied by a close examination of the present-value condition. This is done in two ways.

First, we look at a system of equations to see if past values of  $Q$  have any additional predictive power when other lagged variables are also used to explain the data. Our results indicate that  $Q$  does predict the debt to capital ratio, growth in debt and investment. However, contrary to some US results, we do not find evidence that it predicts short-run fluctuations in equity returns or firms' earnings.

Second, we look at the question of whether  $Q$  can by itself predict variables for horizons ranging from 1 to 32 quarters, a common method in empirical finance studies. There are some well-known statistical problems arising from the fact that the tests for statistical significance are biased by the 'overlapping' nature of the data, which (among other things) causes forecast errors to be very strongly correlated between observations. We use some standard test corrections to take care of this, but we also consider some less commonly used corrections. These included 'bootstrapped' standard errors (where the uncertainty about our estimates is estimated by taking repeated samples of the original data), and a newly developed theoretical correction (derived under the standard assumption of a 'long' sample length). These different methods provide a coherent picture, in the sense that  $Q$  is able to predict equity returns as well as the investment to capital ratio and changes in the capital stock. In particular, as predicted by theory,  $Q$  is negatively related to returns and positively related to investment and capital growth, over medium and long horizons.

We therefore conclude that, at least for UK data, the common perception that  $Q$  is interesting from a theoretical perspective, but of little empirical relevance, is not true. In contrast, it appears to be a rich source of information about real and financial quantities.

# The yen real exchange rate may be stationary after all: evidence from non-linear unit root tests

## Summary of Working Paper no. 311 Georgios Chortareas and George Kapetanios

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Purchasing power parity (PPP) is the hypothesis that goods will trade at roughly the same price in different countries, once adjustments have been made for exchange rates. It is usually thought of as a long-run proposition. One way of examining this is to see if the real exchange rate (the exchange rate adjusted for relative prices in different countries) tends to return to a long-run average. This is known as mean reversion, and is one of the characteristics of a 'stationary' process. The empirical literature that tests for PPP by focusing on the stationarity of real exchange rates has so far provided, at best, mixed results. The behaviour of the yen real exchange rate, of all major currencies, has most stubbornly challenged the PPP hypothesis and deepened this puzzle. The yen real exchange rate in the post-WWII era has been characterised by a trend-like appreciation. Earlier attempts to reconcile the movement of the real yen with PPP theory included consideration of behavioural breaks, but the results were disappointing. As a consequence, Japan is often considered as the typical example of PPP failure.

In this paper we provide new evidence on the stationarity of bilateral yen real exchange rates and the validity of PPP by considering non-linear behaviour; that is, the possibility that the yen real exchange rate behaves differently at low and high

levels. To do so we employ a non-linear version of the widely used Augmented Dickey-Fuller test, which tests for stationarity. This extension increases the ability of the test to detect stationarity when the underlying process is non-linear. The econometric model can accommodate the possibility that an implicit 'corridor regime' exists; within this corridor real exchange rates do not converge to their average values, but once they cross the thresholds of this regime they do begin to do so. This type of behaviour is consistent with the recent theoretical models where the non-linear behaviour of the real exchange rate implies a 'band of inaction'. Our results suggest that the bilateral yen real exchange rates against the other G7 and Asian currencies were mean reverting during the post-Bretton Woods era. In particular, the bilateral yen real exchange rate against the other G7 currencies appears to be stationary over our full sample (beginning in 1960), and this result does not change when we restrict our attention to the post-Bretton Woods era (with the exception of the yen/DM real exchange rate). Thus, the behaviour of the real yen may not be so different after all, but is simply perceived to be so due to the complicated nature of its behaviour. In addition to providing support for the PPP hypothesis, our results could motivate further research aiming to explain the underlying sources of yen's non-linear behaviour.

## Exchange rate pass-through into UK import prices

Summary of Working Paper no. 312 Haroon Mumtaz, Özlem Oomen and Jian Wang

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Exchange rate pass-through (ERPT) is the percentage change in local currency import prices following a 1% change in the exchange rate between importing and exporting countries. A one-to-one response of import prices to exchange rate changes is known as *complete* ERPT while a less than one-to-one response is known as *partial* or *incomplete* ERPT. The rate of ERPT has important implications for the effect of monetary policy on domestic inflation as well as for the transmission of macroeconomic shocks and the volatility of the real exchange rate. As such, the relationship between exchange rates and goods prices has been studied extensively in previous work. In this paper, we focus on the pass-through of exchange rates into UK import prices, where these prices are measured for 57 industries. To the best of our knowledge, no research has been done to measure ERPT into UK import prices at this level of disaggregation, and this paper aims to fill this gap.

We use quarterly data from 1984 Q1 to 2004 Q1. Consistent with earlier studies, we find evidence for significant variation among the estimated industry-specific pass-through rates. This cross-sectional variation of pass-through rates poses an interesting problem for inference on the rate of ERPT at the economy-wide level. Our results show that ignoring this variation and simply using an aggregate import price index to

estimate economy-wide pass-through rate can lead to a substantial upward bias in its measurement. Consequently, the aggregate ERPT rate can appear to be significantly higher than its true value. Using an estimation method that accounts for cross-sectional variation, we find evidence for short-run and long-run partial pass-through into import prices for the two import categories we construct using our industry-level data, namely food and manufacturing. Similarly, the economy-wide ERPT is also found to be partial, possibly reflecting the relatively large weight of manufacturing goods in UK imports. Further, we investigate the source of the cross-sectional variation in ERPT rates. Previous work on ERPT suggests that the variation of pass-through rates across industries relates to industry-specific factors such as the degree of competition, product differentiation, demand elasticities, trade barriers, inflation rates etc. For our sample, we find the industry-specific average inflation rates to be significant in explaining this variation. The final part of the paper examines whether the pass-through rates have varied across time. We find that there has been a significant decrease in the ERPT both at the economy-wide and the industry level. Our estimates suggest that this decrease can largely be explained by the increased stability of the UK economy over the past decade.

# Bank capital channels in the monetary transmission mechanism

## Summary of Working Paper no. 313 Bojan Markovic

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Theory and empirical evidence suggest that the health and the behaviour of the banking sector can alter the way monetary policy affects inflation and output. Furthermore, a number of theoretical studies have suggested a potential role for bank capital regulation in determining bank lending decisions. Put simply, the transmission of monetary policy tightening through the banking sector is likely to be stronger when the level of bank capital approaches the minimum required by the regulator. This study assesses this 'bank balance sheet channel' using a theoretical model that extends the well-known Bernanke, Gertler and Gilchrist model of the corporate sector balance sheet channel.

The results suggest that monetary policy decisions can have a stronger effect in times when the health of the banking sector deteriorates. Banks may find it more costly to raise the fresh capital required to fulfil regulatory requirements. Moreover, the cost of raising fresh capital may rise further in economies where banks are not rated by external rating agencies, or where they disclose less information to the public, since in such circumstances potential bank shareholders may find it more costly to check the health of a particular bank. This higher cost of bank capital is further transferred to a higher cost of companies' external borrowing through an increase in loan interest rates.

This study further suggests that the impact of monetary policy can be asymmetric. An increase in interest rates is likely to lead to a fall in the value of bank capital, thus increasing the likelihood of hitting the binding capital constraint. If the latter occurs, banks have either to raise fresh capital or to reduce their loan supply. In contrast, a fall in interest rates does not

produce similar effects where the additional capital is in excess of regulatory requirement.

The importance of 'the bank balance sheet channel', modelled here, can therefore vary over time. First, the bank capital constraint is more likely to bind in times of contractions (ie rises in interest rates). Here a greater need for banks to raise fresh capital coincides with an increase in the cost of it. Furthermore, the importance of the channel increases at times when the health of both the banking and corporate sectors jointly deteriorates. In contractions, companies' internal funds may dry up, and they have to rely more on external borrowing. The higher loan demand could lead to a binding bank capital constraint, which is exacerbated by the lower value of bank capital. Finally, the relative importance of 'the bank balance sheet channel' is likely to increase in periods of occasional, but large, direct shocks to banks' balance sheets. Such shocks may occur as a result of regulatory changes or structural reforms of the banking sector. Changes in the framework of bank capital regulation or an economy-wide write-off of non-performing loans are examples of such a situation.

There are a number of potential avenues for further work. Contemporary discussions about the new Basel proposals for international bank capital regulation and their potential impact on the effectiveness of monetary policy could be addressed in this framework. The analysis in this study does not however deal explicitly with the case of 'credit rationing', when banks limit their credit supply below the level of credit demand, given the same loan interest rate. In such a case the contractionary effect may be even stronger than the one proposed in this study.

# Consumer credit conditions in the United Kingdom

## Summary of Working Paper no. 314 Emilio Fernandez-Corugedo and John Muellbauer

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It is widely perceived that credit supply conditions for UK consumers have been liberalised since the late 1970s, with implications for the housing market and consumer spending. Consumption and the housing market (with changes in credit availability likely to have contributed) were important factors in the economic boom of the late 1980s and the subsequent recession of the early 1990s.

The need for a credit conditions index (CCI), which measures credit availability other than through the level of interest rates, has been recognised in previous work on consumption. Proxies such as unsecured credit to income ratios and interest rate spreads have been used in empirical work. However, such proxies are unsatisfactory because they depend on the economic environment. This paper constructs a CCI, that, as far as possible, is free of this criticism because it controls for the effects of the economic environment. The paper constructs a CCI for households between 1976 and 2001. The index is constructed by assuming that there is an unobserved common influence (credit conditions) in each of ten credit indicators. Because this is assumed to be the same in each indicator, it is possible to back out an estimate. The history of institutional changes in the credit markets is used to guide the estimation of the CCI. Two of the ten credit indicators are aggregate unsecured debt and mortgages (secured debt). The remaining eight consist of the fractions of high loan to income and high loan to value mortgages for UK first-time house buyers split by age and regions. We argue that mortgage defaults largely arise from the coincidence of having a poor debt/equity position and experiencing cash-flow problems. So mortgage lenders limit initial loan to value and loan to income

ratios to control the risk of default. We use these arguments to model the fractions of first-time buyers with high loan to value ratios and high loan to income ratios. We build on previous literature to derive specifications for aggregate unsecured and mortgage debt, although the attention to expectations and risk distinguish these models from previous work.

To ensure that, as far as possible, the CCI is not affected by the economic environment, we test and include a large set of economic controls. We start from a very general specification, so we carefully consider what theory tells us the effects of the controls should be. As far as possible, the CCI should measure credit availability, ie the supply of credit available to a typical household, once economic and demographic influences have been removed. The econometric results produce two credit condition indices. In one case, the CCI has only a direct impact on the level of credit. In the other, it works in combination with other variables, so that, for example, the influence of the real interest rate and housing wealth on debt shifts with CCI. Both indices increase in the 1980s, peaking towards the end of the decade. They fall partway back in the early 1990s, before increasing again towards the end of the sample. All equations include a common risk factor that depends upon a measure of inflation volatility, the change in the unemployment rate and a measure that is designed to capture the possibility of housing returns declining, all in the previous two years, and the mortgage possessions rate in the previous three years. At the same time, we also estimate new models for unsecured debt and mortgage debt.



# Speeches



# The Governor's speech<sup>(1)</sup> at the Great Hall, Winchester

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My Lord Lieutenant, Ladies and Gentlemen.

Thirty years ago, inflation reached 27% — the highest that any G7 country has experienced in the past 50 years. A few months later, Southampton won the FA Cup for the first, and only, time. You will be pleased to know that I see no causal relationship. Later in 1976, Jim Callaghan, as Prime Minister, delivered a famous speech to the Labour Party Conference in which he said 'We used to think that you could spend your way out of recession ... I tell you in all candour that option no longer exists, and in so far as it ever did exist, it only worked on each occasion since the war by injecting a bigger dose of inflation into the economy, followed by a higher level of unemployment as the next step'. One of the economists who developed that insight — an American, Professor Edmund Phelps — was yesterday awarded the Nobel Prize. Low and stable inflation — 2.5% at present — is now the cornerstone of our economic policy.

In that 1976 Cup Final every one of the players came from the British Isles. Today, it is hard to find British players among the top Premiership teams — globalisation is everywhere. We are all eyewitnesses to the tremendous economic impact of the integration of hundreds of millions of people in China, India, and the former Soviet Union into the world trading system.

Globalisation has magnified world supplies of manufactured goods and capital as well as the labour force. Prices of all three have changed, and we have not been immune to those changes. Between 1995 and 2005 the prices of consumer goods imported into Britain fell by around one third relative to the average price of other goods and services. But the greater supply of manufactured goods from newly industrialised countries has come at the cost of a greater demand by those same countries for energy and raw materials of all kinds. The prices of oil, steel, copper, lead and nickel have all more than doubled.

And in a buoyant British labour market it is not just foreign-born footballers who have been in demand. Over the past two years, around half a million migrant workers (or possibly considerably more, we simply do not know) have arrived from the new member countries of the European Union and elsewhere in the world. It is unlikely that migration on that scale has had no effect on wages, or, indeed, on rents and house prices.

Some of you may be tempted to think that because the growth of the Chinese economy has affected key prices in our own economy, inflation in Britain is now largely determined overseas. Low inflation in industrialised countries, it is argued, is made in China. As with the Arthurian legends, epitomised by King Arthur's Round Table above us, that too is a myth. Despite large changes in relative prices, the average change in prices — inflation — has been remarkably stable. Indeed, it is striking that in a decade in which prices moved so much, overall inflation was more stable than in any decade for a hundred years. It was a decade that in my first speech as Governor, I described as NICE — a non-inflationary consistent expansion.<sup>(2)</sup>

How can inflation be stable when individual prices move around so much? The explanation is that inflation is the result, in the old adage, of too much money chasing too few goods. Inflation arises when the total amount of money spending (or nominal demand) in the economy is greater than the value today of the available goods and services. When the Bank of England changes Bank Rate to keep consumer price inflation close to the target of 2%, we influence — albeit imprecisely and with a time lag — the amount of money spent in the economy and so the inflation rate.

In short, inflation is made at home.

Nevertheless, we cannot and do not control the price of every item in your shopping basket. That distinction between changes in individual prices and changes in the average level of prices is fundamental to an understanding of recent movements in inflation and the response to them of the Monetary Policy Committee.

Let's take a closer look at the NICE decade. Two factors were particularly important in delivering stability. First, companies and employees responded flexibly to sharp movements — both up and down — in input costs. That new-found flexibility, unlike in the 1970s, meant that firms absorbed cost pressures partly in profit margins, partly through efficiency improvements, and partly by resisting increases in the prices of

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(1) Given on 10 October 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech284.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech284.pdf).

(2) Speech at an East Midlands Development Agency/Bank of England Dinner in Leicester, October 2003, available at [www.bankofengland.co.uk/publications/speeches/2003/speech204.pdf](http://www.bankofengland.co.uk/publications/speeches/2003/speech204.pdf).

other inputs. With a clear commitment by the Bank to meet the inflation target, raising prices (so losing market share) was a less attractive strategy for meeting the challenge of higher input costs than searching for ways of reducing other costs. And employees recognised that the consequences of higher world prices, such as for energy, on living standards could not be avoided by higher money wages. So wages rose more slowly when employers faced higher National Insurance contributions and energy prices than when the costs of imported inputs were falling.

Second, monetary policy supported a broadly steady path for total money spending — during the decade 1995–2004, the growth rate of nominal domestic demand fell within a narrow range of between 5<sup>1</sup>/<sub>4</sub>% and 6<sup>1</sup>/<sub>4</sub>% in all but one year — so that the new flexibility meant that price rises in some parts of the economy were balanced by price falls elsewhere, leaving inflation overall close to the target. When the prices of some goods fell, such as imports in the late 1990s, people had more disposable income to spend on other goods and services. That pushed up demand in those sectors and encouraged companies to raise prices. Conversely, when some prices rose, as with energy prices over the past two years, the resulting squeeze on income available to spend on other goods and services helped to bear down on inflation in those sectors. With steady growth of money spending, a change in relative prices can be consistent with stable inflation overall.

Monetary policy — a credible commitment to the inflation target and a broadly stable growth of total money spending — was then, and is always, the key to low and stable inflation. That point was made forcefully in a speech in February by the late David Walton, whose untimely death in June was a great loss to the Monetary Policy Committee.

Over the past couple of years our economic performance has not been quite as 'nice' as in the NICE decade, but it was 'not so bad'.<sup>(1)</sup> In 2005, output growth slowed to 1.9% and inflation rose to 2.5%. Back in 1976, to describe this as 'not so bad' would have been the understatement of the year. It followed a period of rather strong nominal domestic demand growth which, by placing pressure on the supply capacity of the economy, accounted for some of the subsequent pickup in inflation. At the same time, sharp rises in the prices of oil and other commodities reduced the income households had available to spend on more discretionary items and put downward pressure on those prices. Not surprisingly, that loss of spending power was one of the contributory factors to the standstill in consumer spending in the second quarter of last year. But since then consumer spending and output growth in the economy have picked up, and in the first half of this year were growing at around their long-run average rates.

After a prolonged period during which consumer price inflation was below its 2% target, inflation has been above target for

much of the past year. So what are the challenges facing the Monetary Policy Committee as it tries to bring inflation back to the 2% target?

Since their peak in early August, oil prices have fallen by around a quarter. In due course, that will ease the pressure on petrol prices and fuel bills, including gas and electricity. The direct impact was seen in the producer price data published yesterday, and will be seen in CPI inflation over the coming months — making it less likely that I will have to write an explanatory letter to the Chancellor than was the case two months ago — although the anticipated fall in inflation for September may not persist for long.

Over the past year, profit margins, especially in manufacturing, have been squeezed and outside the oil sector the share of profits in GDP has fallen. The recent fall in oil prices will ease the pressure on firms' input costs allowing them to restore profit margins without an increase in output prices. Nevertheless, according to surveys, businesses are more likely to raise prices than during the NICE decade. And in their own survey, the Bank's Agents found that half of those (largely manufacturing) firms which had experienced some erosion of margins were now intending to raise prices.

A change in oil prices does not in itself tell us where overall inflation is headed in the medium term. For that, we need to look at the balance between money spending and potential supply.

The growth of total money spending in the economy has picked up in recent quarters — nominal domestic demand rose by 6% in the year to Q2. And the growth rate of broad money and credit in the economy is now higher than at any point since 1990.

There is, however, great uncertainty about potential supply. The possibility of continuing migration from the new member countries of the European Union and elsewhere is likely to increase the potential labour force available to UK employers. And it appears that more people of pensionable age are choosing to continue to work. The difficult judgement facing the Monetary Policy Committee is to what extent that increase in labour supply, and hence potential output, will allow a faster expansion of total money demand without upward pressure on inflation.

Given the uncertainties about the supply potential of the economy, we will need to keep our eye on the ball and monitor closely the evolution of wage and cost pressures. But it is no easier for the Monetary Policy Committee to read those than for most English batsmen to read Shane Warne's deliveries,

(1) Not so bad: not of the same order but also desirable. See speech at the Eden Project, Cornwall, October 2004, available at [www.bankofengland.co.uk/publications/speeches/2004/speech229.pdf](http://www.bankofengland.co.uk/publications/speeches/2004/speech229.pdf).

and it is just as difficult for someone who, in terms of MPC meetings is 114 not out as it is for those still playing themselves in. The new factor is that, although wage pressures have so far been subdued, it is still not clear that earnings have been sufficiently restrained to accommodate the past rises in energy prices and the fall over the past year in the prices of our exports relative to our imports without a squeeze on profits. Ultimately, both developments must result in lower real incomes.

At this point, let me save the economic commentators a degree of anguish. Nothing in this speech is meant as a hint about our decision in November, which will be based on an assessment of the outlook for inflation two years or so ahead. That decision will be taken only in November, and much can change between now and then. Rather, I have tried to explain the challenges facing the MPC when it decides on interest rates.

Although we can control our own inflation rate in the medium term, temporary fluctuations in output and inflation will occur. We saw that in 2005. Moreover, we cannot insulate ourselves from the real economic consequences of the extraordinary

changes taking place thousands of miles away from our own island. They will affect what we produce, what we buy and, most important, our standard of living. But to say that we are exposed to changes in the rest of the world is a far cry from saying that monetary policy is impotent to control inflation.

It is highly appropriate that I have been talking this evening about the recent decisions of the Monetary Policy Committee in the shadow of King Arthur's Round Table. For the Round Table symbolised the equality of the knights. To quote one authority, 'there is no head of the table at a round table, and so no one person is at a privileged position'. Equally, the Monetary Policy Committee comprises nine members, each with one vote, and the decision is determined by a majority of those votes rather than by consensus. No individual has a monopoly of wisdom and the pursuit of a consensus may hinder the discovery of the truth. Of course, I would not claim that the Bank of England is the long-lost site of Camelot, nor that meetings of the MPC are characterised by jousting and feasting. But I hope you can see that in its deliberations, the MPC has adopted the spirit, if not the literal shape, of the Round Table.

# Trusting in money: from Kirkcaldy to the MPC<sup>(1)</sup>

My Lord Lieutenant, Chancellor, Principal, Chair of Governors, My Lords, Ladies and Gentlemen.

In June 1767, Adam Smith wrote from Kirkcaldy to his dear friend David Hume: 'My Business here is Study in which I have been very deeply engaged for about a Month past. My Amusements are long, solitary walks by the Sea side. You may judge how I spend my time. I feel myself, however, extremely happy, comfortable and contented. I never was, perhaps, more so in all my life'.<sup>(2)</sup> There is more wisdom in that remark than most busy people would ever care to admit, and it was perhaps that contentment which allowed his mind to wander far and wide — across the sea by which he walked — to imagine a society and an economy very different from the one in which he lived.

Last year I was in the audience when Alan Greenspan delivered the Adam Smith Lecture. Now I too share the privilege of speaking in the Kirk where Gordon Brown's father used to preach to the people of Kirkcaldy. Double trouble, you might think. I am particularly mindful of the controversy which Greenspan's lecture stirred in the world of Smith scholars: 'an unseemly battle is being fought over the soul of Adam Smith', as one remarked. It is a sign of the resurgence of interest in Adam Smith that at almost every point on the political spectrum one can find people who claim Smith as their own. But, in a lecture in 1926 to commemorate the 150th anniversary of the *Wealth of Nations*, the economist Jacob Viner wrote, 'Traces of every conceivable sort of doctrine are to be found in that most catholic book, and an economist must have peculiar theories indeed who cannot quote from the *Wealth of Nations* to support his special purposes'.<sup>(3)</sup>

My intention today is certainly not to propose 'peculiar theories', but to examine the importance of social institutions in a market economy. Self-interest explains many economic decisions. But a market economy also requires social institutions.<sup>(4)</sup> They represent collective agreements about how to constrain our actions. Some social institutions constrain our individual actions. For example, a market economy cannot flourish in a world of anarchy in which we suspect that everyone else will cheat. If I lend you money it is in both our interests that there be some mechanism by which repayment can be enforced. So property rights, and courts to enforce contracts and adjudicate competing claims are

examples of some of the social institutions required to support a market economy.

But there are other, and for my purposes more interesting, social institutions which constrain our *collective* actions, both now and in the future. In particular, it is on the need to constrain our *future* collective decisions on which I shall focus this evening. Such constraints are necessary to support the willingness to make transactions. For example, if people believe that there is a high probability that investment made today will be confiscated by the government in the future, they are not likely to make that investment. It would be beneficial if we could constrain ourselves not to confiscate in future. But we can never commit future generations — or even our future selves — to collective decisions. There is no way of enforcing that commitment. Constitutions can be rewritten, property rights revoked, and revolutions have been known to occur.

But we can try to find ways of making it more or less credible that we will, collectively, act in a way that is conducive to our long-run prosperity. One of the most important ingredients of a successful market economy is the set of institutions that constrain our future collective behaviour. Such institutions have cultural and political roots, but they have economic effects. My focus tonight will be on money: money as a social institution that makes the world go round, in the words of Joel Gray in the 1972 film of *Cabaret*. And I shall try to relate the origins of money as a social institution to the role of the Monetary Policy Committee today.

Let me begin, though, with Adam Smith himself. Despite a rather solitary life, much of it here in Kirkcaldy, and shunning invitations to join friends in Edinburgh, let alone London, he wrote two great works — *The Theory of Moral Sentiments* and

(1) The Adam Smith Lecture 2006 delivered by the Governor on 29 October 2006 at St. Bryce Kirk, Kirkcaldy, Scotland. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech288.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech288.pdf). I am indebted to Alex Brazier, Chris Salmon, Morten Spange and Tony Yates who have worked closely with me and are effectively co-authors. I am also grateful to Charlie Bean, Tim Besley, Mark Cornelius, Andrew Hauser, Iain McLean, James Proudman and Peter Rodgers for their helpful comments and to Kath Begley for valuable research assistance.

(2) Letter to David Hume, 7 June 1767, in 'The correspondence of Adam Smith', Glasgow edition of the *Works of Adam Smith*, 2nd edition, page 125.

(3) See Viner, J (1927).

(4) There are, of course, many private institutions, such as companies, charities and universities. But in this lecture I shall be concerned only with social institutions that relate to collective decisions.

*An Inquiry into the Nature and Causes of the Wealth of Nations* — that owe much to careful observation of the world and contain numerous practical examples of how industry and society worked. They are no dry academic treatises but commentaries on the world around him. They contain many insights, two of which are particularly relevant to my theme. First, to reap the benefits of the division of labour requires social institutions that give confidence to people to take up specialised employment. Social institutions and market economies go hand in hand. Second, people who, for the most part, pursue their own self-interest, are also prepared to stand back and ask how their actions should be constrained by social institutions. Such institutions arise because we build them.

On the first, the *Wealth of Nations* begins with the most famous example of Smith's commentary. He explains the idea of the division of labour by looking at 'the trade of the pin-maker': 'a workman not educated to this business ... could scarce, perhaps, with his utmost industry, make one pin in a day, and certainly could not make twenty. But in the way in which this business is now carried on, ... it is divided into a number of branches ... One man draws out the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head; ... the business of making a pin is, in this manner, divided into about eighteen distinct operations'.<sup>(1)</sup>

Smith describes seeing a small factory of this kind in which the daily output of pins was almost 5,000 for each person employed. Specialisation increases productivity. The division of labour permits 'this great increase of the quantity of work'.<sup>(2)</sup> But the higher living standards which the division of labour permits require institutions that allow us to exchange what we each produce. Smith described how 'in a nation of hunters, if any one has a talent for making bows and arrows better than his neighbours he will at first make presents of them, and in return get presents of their game'.<sup>(3)</sup> But a man who spends all day making arrows to swap them for meat gives up the chance of hunting himself for the chance of sharing in a larger catch. To be willing to specialise, the hunter who turns arrow-maker has to be sure that his partner in trade will deliver the 'present' of meat. When the timing of these exchanges is not coincident, there is a need for social institutions to prevent one party reneging on the transaction, and, in particular, for money — an issue that I will return to later.

Smith's second insight was that the social institutions necessary to exploit the full potential of a market economy were not derived from the relentless pursuit of self-interest, but from the recognition that we all benefit from what he described in *Theory of Moral Sentiments* as the exercise of 'sympathy'. In other words, we step back from our immediate situation and ask: how do my actions affect others?

Answering that requires an ability to imagine ourselves in others' shoes — 'sympathy'. That sympathy in the hunter, for example, might mean feeling the pain of a starving arrow-maker.

Smith argued that we 'are endowed with not only a desire of being approved of, but with a desire of being what ought to be approved of ...'.<sup>(4)</sup> He talked about an 'impartial spectator' whose judgement we imagined and imposed as a constraint on our own behaviour. Smith thought the 'impartial spectator' fundamental to an orderly and prosperous society. It is what stops the hunter from breaking his promise to share his meat and, knowing that, it is what gives the arrow-maker the confidence to stop hunting. It was the 'main pillar that upholds the whole edifice. If it is removed, the great, the immense fabric of human society ... must in a moment crumble to atoms'.<sup>(5)</sup>

But Smith recognised our own frailty. The temptation to follow our immediate self-interest could sometimes be overwhelming, and our own 'selfish passions' would take precedence over the judgement of the 'impartial spectator'. As commercial society evolves, and we exchange with those much more remote from us, our human frailties matter more. We need a mechanism to help us exhibit the 'sympathy' that is both desirable and necessary.

We need social institutions to bolster our often erratic ability to see things from the perspective of the impartial spectator. These social institutions are not just given to us. We choose to build them as a framework for collective decisions that constrain individual behaviour. We make them, and sometimes we break them.

These two points from Smith's commentary — the importance of institutions and our desire to build them — are closely related to the role of trust in a modern economy.<sup>(6)</sup> How could we drive, eat, or even buy and sell, unless we trusted other people? It is surely trust not money that makes the world go round. Indeed, we shall see that money works only when it is trusted. But human frailty implies that trust can be placed

(1) *Wealth of Nations*, I, i, page 14.

(2) Did Adam Smith ever visit a pin-factory? He was certainly a careful observer of the world around him. As Buchan (2006, page 12) wrote, 'He had visited dye-works, pin-makers, brewers and distilleries'. His description in the *Wealth of Nations* of 'a small manufactory ... where ten men only were employed' makes clear that Smith did, at some point, visit a pin-factory, but there is little evidence as to where that was. And most scholars believe, with good reason, that Smith took the example of a pin-factory from the *Encyclopédie*, edited by Diderot and d'Alembert and published in France in 1755 — the article on *épingle* describes in some detail the 18 operations identified by Smith. I am indebted to Professor Iain McLean of Nuffield College, Oxford, for drawing this entry to my attention. But his example of nail-making a few pages further on did come from personal experience, since the manufacture of nails took place in the villages of Pathhead and Gallatown which Smith visited on his regular long walks.

(3) *Lectures on Jurisprudence*, B, Report dated 1766, page 493.

(4) *Theory of Moral Sentiments*, III, ii, 7, page 117.

(5) *Theory of Moral Sentiments*, II, ii, 3.3, page 86.

(6) In her 2002 Reith lectures 'A question of trust', Onora O'Neill argued that in order to interact with others, both as individuals and institutions, trust plays a crucial role.

more easily when it is supported by institutions. Those institutions may well require trust, but equally trust requires institutions.

Many economists — including Viner in the essay I have already quoted — have regarded Smith's analysis of self-interest in the *Wealth of Nations* as inconsistent with his discussion of 'sympathy' in his *Theory of Moral Sentiments*. In one of the best-known sentences from the *Wealth of Nations*, Smith points out 'It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest'.<sup>(1)</sup> Smith, so the critics argue, failed to integrate the thinking in his two great works.<sup>(2)</sup> It would not be a sensible division of labour for me to enter the debate about whether his two great works form a consistent whole or represent two different and inconsistent viewpoints. Smith was a cautious and often obscure author. What we know of his theory of law and government is through the notes of two students who attended his lectures on jurisprudence. His failure to produce the projected third great work means that we do not know what institutions he thought would best support a market economy. But irrespective of what Smith thought, two things are clear. First, history is littered with failed attempts to order society without reference to individual incentives. Second, we understand the need for social institutions to constrain our actions.

Since Smith, economists have underplayed the importance of institutions, although there have been notable exceptions such as Douglas North and Ronald Coase. Over the centuries, theories of a competitive market economy have been refined. From these theories flows the remarkable result that, under certain conditions, the pursuit by each person of their individual self interest leads to a more efficient outcome for society as a whole. That work reached its apogee in the post-war work by Kenneth Arrow and Gerard Debreu. Those economic models are, however, silent about many of the institutions that are fundamental to the results.<sup>(3)</sup> But without the appropriate institutions we tend to anarchy not prosperity. The challenge facing us is to design and maintain the right set of institutions, and to abolish the unhelpful ones. And it is that challenge of institutional design to which I now want to turn.

You will not be surprised to learn that, as Governor of the Bank of England, money is a social institution close to my heart. It is crucial in facilitating exchange and therefore, in allowing the division of labour. Smith explained that 'when the division of labour first began to take place, this power of exchanging must frequently have been very much clogged and embarrassed in its operations.'<sup>(4)</sup> He was referring to the absence of what economists call a 'double coincidence of wants': the hunter wants arrows and the arrow-maker wants meat. Without that double coincidence exchange cannot take place through barter.

Promissory notes, or 'IOUs', can act as promises to deliver in the future. And they could, in principle, circulate — we could then exchange with people whose own produce we don't actually want. Imagine Smith's primitive arrow-maker doesn't want meat. He can still exchange his arrows for a promise of meat from the hunter. But he will do so only if he is sure that others, whose output he does want, will accept the hunter's IOU. And that depends on whether the arrow-maker believes that others will trust the hunter's promise to pay. Once future delivery is part of the exchange, trust is essential.

So we need to be able to trust in the promises of others to pay. In large commercial societies, where the 'I' is remote from the 'U', relying on our own human 'sympathy' is unreliable — debtors would be tempted to default with those they have never met. We recognise that we need a social institution. One such is a legal system that can be used to enforce IOUs. But enforcement is costly. These problems encouraged us to build another institution — money. This recognition that money is necessary because of our own frailty in honouring IOUs suggests that 'evil is the root of all money'.<sup>(5)</sup>

Smith had seen how commodities like 'dried cod at Newfoundland; tobacco in Virginia; sugar in some of our West India colonies' had been used as money and how there was even 'a village in Scotland where it is not uncommon, ..., for a workman to carry nails instead of money to the baker's shop or the alehouse'.<sup>(6)</sup> These commodities guaranteed a double coincidence of wants — most people smoked, needed to preserve meat with salt, and ate fish. And because these commodities have intrinsic value, the trustworthiness of our trading partners was not an issue. Salt is salt whether offered by an honest trader or not.

But it is costly to produce and hold large stocks of these commodities. Salt kept to one side for use as money has to be mined, and cannot be used to preserve meat. And the quality and quantity of the commodity is not easily verifiable. In fact, this was a pressing concern for Smith as a university lecturer because he would have been paid in person, in coin or specie,

(1) *Wealth of Nations*, I, ii, 2, page 26.

(2) Rothschild (2001) puts Smith's writings in the context of the Enlightenment and, while pointing to the complexity of Smith's views and his caution in expressing them in public, paints an overall picture of a man who is not best described as a split personality.

(3) Economists have grappled with the challenge of understanding worlds in which there are not markets for everything. Coase understood the existence of firms to be a manifestation of how market-based exchange between employers and employees was not efficient (see his 1991 Nobel lecture, for example). More recently, economists like Kiyotaki and Moore (an example is their 2002 paper) and many others have built models in which debt markets are incomplete because it is costly to enforce contracts, and which constrain the amount individuals can credibly borrow and pay back. These models can also be used to explain how money comes to exist, as I discuss below. Another body of work that seeks to study the institutions that underpin market exchange is the subject that has come to be known as 'law and economics'. Scholars in this field study the economic origins and consequences of the legal system. See, for example, many works by Gary Becker, Ronald Coase and Richard Posner.

(4) *Wealth of Nations*, I, iv, page 38.

(5) See Kiyotaki and Moore (2002).

(6) *Wealth of Nations*, I, iv, page 38.

by his students before the lectures began, something which I regret I forgot to do this evening. Smith's close friend, the chemist Joseph Black, said that he was 'obliged to weigh [the proffered coins] when strange students come, there being a very large number who bring light guineas, so that I should be defrauded of many pounds every year if I did not act in self-defence against this class of students'.<sup>(1)</sup>

And so we arrive at paper money. I have here a £20 note. What is it? Money you say. Surely it is just a piece of paper. What is the difference between a piece of paper and money? You can 'buy stuff with it'.<sup>(2)</sup>

Why can we get anything in exchange for these intrinsically worthless pieces of paper? It is because those to whom we give the paper expect that they will, in turn, be able to get something for it. That rests on the expectation that whoever they pass the paper to will in their turn be able to get something for it, and so on, *ad infinitum*. In short, the value of paper money depends on trust.

But it is not easy to trust paper money unless we trust the issuer. Much of the financial history of the past 150 years is the story of our collective attempts to manage paper money. In a democracy, we can't force people to use paper money, although after the French Revolution the Jacobins had a try. They made it a capital offence to use commodities as money! This was a desperate and unsustainable action resulting from the Jacobin policy of debasing their paper money — the Assignat — to make up for a collapse in tax revenues and to finance a war against Prussia.

A more sensible solution is to create institutions in which we can have trust. On the front of this Bank of England £20 note is written 'I promise to pay the bearer on demand the sum of Twenty Pounds'. In essence, the promise is that the 'stuff' that you can buy with this note does not change much from one year to the next. In other words, the general purchasing power of the note is broadly stable — we have price stability. Our ability to maintain price stability depends upon an institutional framework which is expected to persist. That depends on all of us — the value of a nation's money is inherently a political choice. Inflation arises when the collective political commitment to maintain price stability weakens.

When high rates of inflation are anticipated, people wisely avoid holding paper money. As I said in my Ely lecture in 2004, 'the demand for money today depends upon expectations of our collective decisions about the supply of money tomorrow'. In the 20th century Germans saw their savings wiped out by hyperinflation. And as recently as 1990, Argentina experienced hyperinflation. I have been told that when people gave up using paper money in Argentina, they resorted to IOUs which were taken to the local Catholic priest for endorsement. Those IOUs were trusted because to renege

on a promise endorsed by the priest would have very serious consequences, whether in this life or the next.

It is sometimes tempting — as the examples of the Jacobins, Germany and Argentina show — for issuers of money to issue too much of it: cheap money and plenty of it, as the saying goes.<sup>(3)</sup> A public monopoly of paper money raises the question of how can we prevent the institution managing that money from abusing its issuing power. We cannot commit future generations — or even ourselves — to a particular policy. So how can we design an institution to create the reasonable expectation that money will retain its value?

In 1997 a new institution — the Monetary Policy Committee of an independent Bank of England — was set up. And for the past decade inflation has been low and stable and economic growth more stable than at any time in living memory. Just as importantly, yields on government bonds indicate that inflation is expected to remain low over the next 50 years. Gordon Brown deserves great credit for designing the institutional arrangements so carefully in advance. This was not a traditional 'make it up as you go along' approach to British economic policy.

In fact, the design is a good example of how to overcome the fundamental constraint faced by social institutions. That constraint is that it is both impossible and undesirable to enforce binding commitments on the collective decisions of our successors. It is impossible because there can be no outside enforcer. It is undesirable because we cannot imagine or articulate every possible future development.

As such, institutions must have, and be likely always to have, widespread support. Their design must meet three principles. First, in order to maximise the breadth and permanency of support, the objective should be as clear as possible. Second, the institution must have the appropriate tools and competence to meet those objectives and be held accountable for doing so. Third, the design must reflect history and experience.

How do our current monetary arrangements meet these requirements?

First, the objective — the inflation target — is clear. It is 2% for CPI inflation.

(1) Rae (1895), page 49.

(2) Smith recognised this too: 'though the wages of the workman are commonly paid to him in money, his real revenue, like that of all other men, consists, not in money, but in the money's worth; not in the metal pieces, but in what can be got for them', *Wealth of Nations*, II, ii, page 295.

(3) Hayek (1976) thought this temptation might be overcome by allowing competitive private banks to issue their own paper monies — the threat of competition would stop them overissuing. But the costs of using several different monies, and the need to monitor the change in their relative values, reduce the benefits from using paper money as a means of payment. Competitive monies have arisen only rarely and usually in situations where government money is either absent or very badly managed.



Second, responsibility for setting interest rates has been delegated to a group of people — the Monetary Policy Committee — with the appropriate technical competence and who face strong incentives to meet the target. Expert judgement is needed because changes in the way the world works mean that monetary policy cannot be run on auto-pilot.<sup>(1)</sup> The members of the MPC must exercise their judgement about the level of interest rates necessary to meet the target, and are held publicly accountable for their individual votes.

Third, these arrangements reflect both our experience of previous monetary failures and the nature of accountability in our political system. The separation between the elected government, which sets the target, and the Monetary Policy Committee, which makes the month-to-month decisions on the level of interest rates necessary to meet the target, is natural in our Parliamentary system. Since countries vary in their political constitutions it is not surprising that their monetary constitutions also differ.

The apparent success of the MPC has led many to ask whether aspects of its design could be carried over to other areas of public policy. The principles of widespread support for the objective of policy, the incorporation of the lessons of history, and the need to ensure technical expertise have general applicability. In the case of monetary policy, there is widespread agreement on the objective of low inflation, the design has taken on board the lessons from our post-war experience about the difficulty of targeting monetary aggregates or the exchange rate, and the MPC has been set up to include appropriate expertise. Moreover, the MPC has to set only a single instrument — Bank Rate.

It may not be easy to find other areas of policy to which the MPC example can be immediately applied. But it is certainly worth thinking imaginatively about the possibilities for other areas in which trust in future collective decisions is necessary. Pensions policy, for example, has for years been bedevilled by a combination of extraordinary technical complexity, which means that decisions take a long time to reach, and the reversal of policies adopted by earlier generations. This is very much an area where we have been unable to constrain future collective decisions. And it is one that would benefit from greater stability of policy.

At the international level, the importance of constraining future behaviour can be seen in such diverse areas as trade policy and climate change. The difference in the degree of agreement on the objectives of policy can be seen in the difference between the institutions that have been set up to deal with those issues. But even the World Trade Organisation, despite the critical importance to the world economy, and especially its poorer citizens, of opening up trade, has found it difficult to arouse sufficient 'sympathy', to

use Smith's word, to get agreement on constraints on our future behaviour.

But let us not be pessimistic. The three principles of institutional design may be helpful in thinking about future collective decisions in areas as diverse as health, education, pensions and taxation, just as they were in constructing a new monetary policy framework. But that is for others to take forward.

## Conclusions

I recognise that the success of central banks in keeping inflation low and stable over the past decade may owe something to good fortune as well as to good policy. But, as the legendary football manager Bill Shankly used to say, 'it's strange, but the better we play, the luckier we get'. What really matters, however, is that we as central bankers acknowledge that we owe everything to the design of the institutional framework. As I have argued this evening, a central part of Adam Smith's legacy is an appreciation of the essential role played by social institutions. So perhaps it is not surprising that it was another son of Kirkcaldy who, over two hundred years later, created the new institutional framework for the Bank of England in 1997. As Niccolo Machiavelli wrote in *The Prince*, 'Nothing brings a man greater honour than the new laws and new institutions he establishes'. A Scotsman founded the Bank of England, and it took another to reform it. Next year we celebrate the tercentenary of the Act of Union, an Act strongly supported by Adam Smith. And we now have a successful and prosperous union between our two countries, with a common monetary institution which embodies the ideas not only of Adam Smith and his great friend David Hume, but also of the key principles that should govern institutional design.

From the division of labour in the pin-factory to the need for our mutual 'sympathy' to be embodied in carefully designed institutions, Smith's writing is remarkable by its comprehensive and eclectic examination of ideas and facts. So it is appropriate that tonight here in Kirkcaldy, where Adam Smith found contentment in study and reflection, I can announce that tomorrow the Bank of England will reveal a new £20 note. And the figure celebrated on the new note is Adam Smith — the first economist and the first Scotsman to appear on a Bank of England note. From next spring, when visitors to our country look carefully at their new £20 notes, they will be able to see an engraving showing the division of labour in pin manufacturing with the words 'and the great increase in the quantity of work that results'. I hope they will absorb the lesson that specialisation in production and trade across the

(1) There is some evidence that committees make, on average, better decisions than individuals. See King (2002), Blinder and Morgan (2000) and Lombardelli, Proudman and Talbot (2005).

world are the way to improve living standards in all countries — rich and poor alike. And perhaps when they return home they will press their own politicians to support the opening up of trade which has been at the heart of the British Government's efforts to reform the world economy.

So you should be proud of your famous son who, despite being 'an absent-minded professor' who led a 'quiet, uneventful life', influenced the way the whole world thinks about the route to economic prosperity.<sup>(1)</sup>

Let me conclude by returning to the words of Jacob Viner: 'In these days of contending schools, each of them with the deep, if momentary, conviction that it, and it alone, knows the one and only path to economic truth, how refreshing it is to return to the *Wealth of Nations* with its eclecticism, its good temper, its common sense, and its willingness to grant that those who saw things differently from itself were only partly wrong'.<sup>(2)</sup>

Truly, Adam Smith was a man of the Scottish Enlightenment, and I am delighted that from next year his face will look out at us from our banknotes.

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(1) McLean (2006).

(2) Viner (1927), page 232.

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# The Governor's speech<sup>(1)</sup> to the Black Country business awards dinner

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The Black Country is where it all began. It began here for me because Wolverhampton is where I grew up. As a boy, I remember the short train trip from Wolverhampton to Birmingham, through the heart of the Black Country, as a journey through manufacturing history. The flames from the blast furnaces lit up the grey sky on winter afternoons. 'Black by day and red by night' as the American Consul in the Midlands once described it. Much has changed since then. It has been a difficult time for the Black Country. Many of the companies we visited from school have closed. And the blast furnaces no longer light up the night sky. But the character of the Black Country has enabled the region to come through and enter a new era of regeneration. So I am honoured, and proud, to have been invited to join you tonight.

The Black Country is where it all began — not just for me, but for the British economy. This was a centre of the Industrial Revolution — the first blossoming of manufacturing industry in the world. The coal and iron deposits found here were critical to the Industrial Revolution, and it was the output of nails and bolts, screws and fasteners produced from those ceaseless blast furnaces that made the Black Country synonymous with manufacturing prowess around the world. But that is not the whole story. Just as important were the innate qualities of doing it yourself and perseverance which characterise the Black Country. There is no finer example than the Iron Bridge — the world's first — at Coalbrookdale, built in 1779. As one commentary noted, it stood as 'indisputable proof of the abilities of our mechanics and workmen'. It reflected not just the local availability of coal and iron, but also the skills of those who built it.

And it is those same skills that we celebrate tonight. Local business success, recognised by these 'Best of the Black Country Awards', is the story of the Black Country being born again. The products of the 21st century may not be the nails and bolts, screws and fasteners of the past, but they will require the use of manufacturing know-how and business ingenuity to service the needs of consumers. I have been struck, as I travel to a different part of the country each month, by how many firms are producing imaginative and innovative products for which there is a real demand around the world. By this I do not mean that all successful firms are making high-tech products. Rather, there is a market out there where low wages are not the most important form of competitive advantage. We have seen that in the 'Best of the

Black Country Awards', where last year's winners were drawn from the manufacturing, services and construction sectors, and included both new and established companies. Moreover, the Black Country tradition of numerous small firms operating cheek by jowl is exactly the model so successful in Silicon Valley and Bangalore, in science parks and film studios, and in financial centres around the world.

Of course, some of the old ways have gone, and many manufacturing companies have perished. Recent years have not been easy for the Black Country, especially as profit margins have been squeezed by greater competition from overseas. But there are — as you yourselves demonstrate — many examples of the regeneration of the Black Country, be they new businesses or older ones refocusing their activities. And the changes under way here are not restricted to the purely economic. The Black Country has seen successes in education, culture and the media. In education, the University of Wolverhampton — impossible to imagine that there would be one when I was a boy — now has over 23,000 students. The University has put its motto — 'Innovation and opportunity' — into practice, through its partnerships with the Wolverhampton Science Park and the Telford-Wolverhampton Technology Corridor. In culture, the New Art Gallery in Walsall opened in its internationally acclaimed building in 1999. And in the *Express & Star*, you have the most successful regional paper in the country.

Sport, too, plays an important role in the life of the Black Country. Next summer twelve schools in the Wolverhampton and Walsall areas will be participating in Chance to Shine — a new campaign to regenerate cricket in state schools, and of which I am proud to be the President. Given that in business the need to work in teams is of the essence, it is sad, more than sad, that competitive team sport in our schools has declined. The aim of Chance to Shine is to give young people from all our communities, boys and girls, a chance to experience — before the world of work — what it is like to be in a team, and to learn how to win and how to lose. Last summer Chance to Shine enabled almost 50,000 children to play competitive cricket for the first time.

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(1) Given in Wolverhampton on 16 November 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech291.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech291.pdf).

Young people need role models and sport is perhaps the most important source of them. Of the many Black Country sports men and women who have been role models down the years, there is one whom I would like to single out tonight — Vikram Solanki. Born in Rajasthan, Vikram moved to Wolverhampton as a small boy, and became the finest and most exciting batsman to emerge from the area for a long while. Now captain of Worcestershire, one could not think of a better role model to bring communities closer together. That is why I am pleased to say that I shall be one of Vikram's patrons for his Benefit year in 2007.

Of course, I could not talk about sport in the Black Country without referring to football. Nowhere had, in my day, more first division teams within a few miles radius than the Black Country. And the supporters of those teams have had many opportunities over the years to learn how to win and, especially, how to lose. But for the sake of local interest and rivalry, I'm looking forward to the day when both Wolves and the Albion are restored to the Premiership.

Just as football needs a referee, so does the economy. I think of the Bank of England's Monetary Policy Committee — the MPC — as the referee for the economy. The MPC sets interest rates to keep inflation on track to meet the 2% target. We want to allow you to focus on running your businesses — you are the players — while the MPC quietly gets on with its job. You may have seen in the news that yesterday the Bank of England published its latest *Inflation Report*. That set out our view on the prospects for the economy over the next couple of years. Perhaps I could briefly summarise our latest analysis of the UK economy.

For the past year GDP has grown at a rate around its long-term average. Inflation has picked up and has been above the 2% target since May. Overall, our central view is one of inflation rising further above the target in the near term, before falling back to the target. The risks around that benign central view are seen by the MPC as broadly balanced, but there is significant uncertainty about the outlook for inflation.

The outlook for growth remains one of a continued modest rebalancing of demand, with consumer spending growing at

close to its long-run average rate, business investment continuing to recover, and net trade (exports less imports) making a small positive contribution to growth.

The MPC judges that assessing the margin of spare resources in the economy is unusually difficult at present. Capacity utilisation within companies, as measured by surveys, has risen. Although unemployment has risen further, it is difficult to know how much of the rise in unemployment actually represents increased slack in the labour market.

Over the past year or so, the labour force has grown rapidly, following strong migration from Eastern Europe and elsewhere, and a rise in participation rates. There is, of course, great uncertainty about the scale of migration which has clouded estimates of the supply capacity of the economy. Moreover, it is difficult to know how far migration affects demand for goods and services as well as supply. So the overall impact of migration on inflation in the medium term is unclear.

Against a background of firm growth and a limited margin of spare capacity, and with inflation above the target, the MPC judged last week that an increase of 0.25 percentage points in Bank Rate was necessary to keep inflation on track to meet the target in the medium term. So that's where we are now. Where will interest rates go next? I don't know. And the reason I don't know is that we don't take our decisions in advance, but wait to see how the economy unfolds and then take our decisions one month at a time.

The Black Country is where it all began. But now we must look to the future. The Black Country has entered a new era. And you are making it happen. I have explained how the MPC sees the prospects for the economy. If we can retain the degree of stability that we have seen now for more than a decade, then you will have the opportunity to start and expand businesses that will compete for Black Country business awards in the years to come. The winners tonight are shining examples, and I know you are all looking forward to finding out who they are.

It has been a pleasure to come back to where it all began for me. And, whether or not you are one of the lucky few to win an award tonight, I wish your business every success.

# International monetary stability — can the IMF make a difference?

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In this lecture,<sup>(1)</sup> Rachel Lomax, Deputy Governor responsible for monetary stability, argues that in a more integrated world economy, there is a greater shared interest in identifying the risks to international monetary stability and in discussing the policy responses that might help to mitigate them. While she sees a central role for the IMF, as the permanent institution set up to promote international monetary co-operation, she says that the Fund's current surveillance activities need to be redesigned to provide a more operational focus on external stability. The IMF should devote more time to overseeing the system as a whole, and focus on the surveillance of those countries with the most potential to create waves in the international monetary system. She outlines proposals for grounding Fund surveillance in a more structured analysis of the policy frameworks that countries themselves choose to adopt and for setting an annual surveillance remit against which the Fund can be held accountable.

Next month will be the 35th anniversary of the Smithsonian Agreement — hailed at the time by President Nixon as 'the most significant monetary agreement in the history of the world'. Today it is remembered, if at all, as a stage in the collapse of the Bretton Woods system of pegged exchange rates. But it also inaugurated a period of intense debate about the future of the international monetary system and the role of the International Monetary Fund, which culminated in the Second Amendment to the Fund's Articles in 1976.

Thirty years on, the Fund's role in promoting international monetary stability is again under scrutiny. The world economy and the international monetary system have been transformed since the late 1970s. The Fund has evolved to deal with new situations and fresh crises. But much more change is needed if it is to meet the challenges of the 21st century. That much is common ground.

Proposals to reinvigorate the Fund's oversight of the international monetary system — surveillance — lie at the heart of the Medium Term Strategy endorsed at this year's Spring Meeting of the IMF. Together with the more widely publicised, and politically charged, commitment to reform the Fund's governance, by rebalancing the quotas that determine member countries' voting rights, they represent a serious attempt, in the words of the Fund's Managing Director Rodrigo de Rato, to 'meet the challenges posed by globalisation'.

The main purpose of my lecture tonight will be to explain the role which a refocused Fund could and should be playing in promoting international monetary stability, and to outline

some steps to build on the agreements reached at the Fund's Annual Meetings in Singapore in September. The next six months will be critical. It is important that we use them to think hard about what the Fund does, as well as to push forward the second stage of the governance agenda.

## The changing role of the IMF

The IMF was originally set up at the end of the Second World War 'to promote international monetary co-operation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems'. The collapse of the system of pegged exchange rates in the early 1970s precipitated a lengthy debate between those, led by the French, who favoured a return to managed exchange rates, and others, led by the Americans, who favoured floating exchange rates. When a compromise was eventually reached, the Fund's Articles were amended to allow member countries to choose between fixed, floating or managed exchange rate regimes, as long as they fulfilled certain commitments.

Members agreed to collaborate with the Fund and other countries to assure external stability through 'orderly exchange arrangements and ... a stable system of exchange rates'. They also assumed specific obligations relating to their domestic

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(1) The GAM Gilbert de Botton Award Lecture delivered on 1 November 2006 at Somerset House, London. I am grateful to Phil Evans, Gregor Irwin and Gareth Ramsay for their help in preparing this lecture. I would like to thank Katie Farrant, Andrew Hauser, Jens Larsen, Chris Salmon and Misa Tanaka for their very helpful contributions. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech289.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech289.pdf).

and external policies. They agreed to avoid manipulating exchange rates to prevent effective balance of payments adjustment or to gain an unfair competitive advantage. And they agreed to direct their domestic policies toward fostering orderly economic growth and price stability.

The Fund's role was also redefined. It was required: first 'to oversee the international monetary system in order to ensure its effective operation', and second to 'exercise firm surveillance over the exchange rate policies of its members and to adopt specific principles for the guidance of all members with respect to these policies'. These principles were subsequently spelt out in a 1977 Surveillance Decision, which focused narrowly on exchange rate policies.

Surveillance duly became one of the Fund's core activities, alongside lending and providing technical assistance. But over the years, the focus of surveillance drifted away from exchange rate issues, as the Fund's central role in promoting international monetary co-operation went into eclipse. Its public profile was dominated by its frequently controversial role as a provider of financial assistance to countries facing external payments crises. International monetary policy co-ordination, on the few occasions when it was actively attempted, became the preserve of small intergovernmental groups of leading industrialised countries, the G5/7 — most famously in the Plaza and Louvre Accords in the mid-1980s.

Over time, the international monetary system has evolved into a patchwork of different approaches to policy, in contrast to the uniformity of the Bretton Woods system. Many large developed countries with open capital markets now pursue independent monetary policies and let their exchange rates float freely, while smaller and less-developed countries tend to peg or heavily manage their exchange rates, effectively surrendering control over domestic inflation. There are regional monetary unions — notably the euro zone. And some emerging and developing economies still combine managed exchange rates with restrictions on capital flows, in an attempt to retain a degree of monetary independence.

## How has the world economy changed?

The backdrop to these developments has been a transformation in the world economy over the past 30 years. For the present purposes, there are two major aspects to what is commonly known as 'globalisation'.

First, there has been a very rapid integration of the world economy. Trade liberalisation, new technology, falling communication costs, and the resulting globalisation of supply chains have contributed to a great opening in national markets. Since 1970, trade openness — defined as the ratio of exports and imports to GDP — has risen from around 25% to over 40% for industrialised countries, and from

15% to 60% for emerging markets. The growth and integration of financial and capital markets has been even more spectacular, especially over the past 20 years. Financial openness — defined as the ratio of external assets and liabilities to GDP — has risen sevenfold for both groups of countries.

Second, the dramatic rise of new economic powers has been simultaneously adding to global productive capacity, and changing the balance of world trade and economic activity.

The entry of China, India and Eastern Europe into the global market economy has effectively doubled the world's supply of labour. The sheer scale and speed of economic development in China alone has been quite without precedent. After 25 years of double-digit growth, it is now the world's fourth largest economy, having overtaken the United Kingdom this year. Its share of world trade has more than doubled over the past decade, making it the third largest trading country behind the United States and Germany.

Increasingly, a small group of industrialised countries will no longer dominate the world economy in the way they did 30 years ago. Measured at market exchange rates, the G7 still accounts for 60% of world output. But if current growth differentials persist, this share will fall to 40% within the next 20 years. And if output is measured using purchasing power parities — to give a higher, and arguably more accurate, weight to relatively cheap non-traded goods and services in emerging markets — the G7 world share has already fallen to that level.

Emerging markets are already a major force in the world economy. Together they make up 80% of the world's population, use half the world's energy and produce over 40% of the world's exports. And over the past five years they have accounted for well over half of total world growth.

## Implications for policy

Taken together, these developments have profound implications for policymakers. The linkages between one economy and another are now wider, deeper and more complex than ever before. One country's policy is more likely to have 'spillover' effects on other countries. The interpretation of economic developments has become more challenging. And the rapid emergence of new economic superpowers is creating a new generation of policy issues.

For example, the addition of large supplies of low cost labour to the world market is affecting global relative prices, especially of manufactured goods and natural resources, as well as intensifying competition in labour and product markets. This seems to be affecting wage and price-setting

behaviour in developed countries, as well as their terms of trade. Domestic policymakers have been left struggling to comprehend how globalisation is changing the behaviour of their own economies, and thus the likely impact of their own policy actions.

From a global perspective, the coexistence, in recent years, of low long-term real interest rates, massive, and rising, US current account deficits and the build-up of huge foreign exchange reserves in Asia has been a source of particular puzzlement and some concern to policymakers.

How confident can we really be that the international monetary system can cope with the stresses and strains of a fast integrating global economy? Deep and liquid financial markets have made it possible to finance huge global imbalances, and may have helped to stabilise the world economy in recent years. But there must be a risk, even if it is fairly remote, that imbalances will unwind in an abrupt or disorderly way which could damage growth and push up inflation.

Globalisation is raising the stakes for policymakers. Closer collaboration should help them to take better-informed decisions. It can deepen their understanding of the impact of global developments and policy spillovers, and give them insights into the likely responses of other policymakers to different scenarios. In a more closely integrated world economy, there is a greater shared interest in identifying the risks to international monetary stability and in discussing the policy responses that might help to mitigate them.

## The Fund and international monetary co-operation — the issues

But even if we accept the case for intensified international monetary collaboration in today's highly interconnected world, does the Fund still have a central role to play? And if so, what is it?

There are two main reasons why, in my view, it does.

First, there is an important role for a permanent institution as a provider of internationally consistent information, impartial expert analysis, assessment and advice. Today's world economy is no longer dominated by a small group of like-minded industrialised countries at similar stages of development; tomorrow's will be even less so. A shared knowledge base will facilitate effective consultation and collaboration on complex and politically charged issues. This is essentially a public good. And while it is possible to envisage alternative arrangements for supplying it, a permanent international institution is likely to offer clear practical advantages.

Second, the Fund already exists. It has the reach and experience to respond flexibly to the changing structure of the world economy. It has nearly universal membership, (now totalling 184 sovereign nations), an agreed legal framework, extensive relevant institutional capacity and a reputation built up over 60 years. Given the costs of acquiring such unique capacity from scratch in the modern world, the benefits of starting again would need to be very substantial indeed.

This adds up to a strong pragmatic case for working with what we have.

So what role should the Fund be playing? Mervyn King, in his speech in Delhi earlier this year, likened the role of the IMF to an umpire in cricket, 'warning the players not to attack each other verbally and making it clear publicly when they believe the players are not abiding with the spirit of the game'.

While I would be the last person to argue with Mervyn, at least about cricket, I initially found this analogy rather unconvincing. In my mind, the term umpire conjures up a portly old gentleman in a white coat and straw boater. Surely the modern IMF should have a more dynamic and up-to-date image? But it turns out that even cricket has moved on. I am not referring to the recent abandonment of the England Pakistan match, for the first time ever, after a heated disagreement between an umpire and players. No, what I have in mind is the advanced computer technology which I gather now exists, aptly named Hawk-Eye, which could assist umpires in making the most difficult calls — those about which the players of the game are most likely to disagree.

So we should think of the IMF as the cricket umpire of the future, with Hawk-Eye in her toolkit — where the Fund's Hawk-Eye will be its impartial analysis, assessment and advice, enabling it to dissect the most difficult policy issues in the global economy.

## Reforming the Fund's surveillance

If that is the vision, the relevant questions are whether the Fund's current surveillance activities are well designed to meet the need; and if not, what can be done to improve matters?

The answer to the first question is clearly no. Despite many reviews, the underpinning Surveillance Decision, agreed three decades ago, has never been revised. And over that time Fund surveillance has drifted a long way from its original — narrowly defined — purpose. Fortunately, there is now broad agreement about the main problems that need addressing.



First, the Fund does not devote enough time and effort to overseeing the system as a whole, through assessing global economic prospects and analysing international economic linkages and policy spillovers (so-called multilateral surveillance). Instead, the great bulk of the Fund's effort has been devoted to producing reports on individual member countries (so-called bilateral surveillance).

Second, these individual country assessments have often lacked focus. The subjects covered have ranged widely, reflecting the preoccupations of the day, including much detail on so-called 'structural' issues. Nor has bilateral surveillance been good at picking up multilateral issues — areas where a country's policies might have wider effects, or where it might be particularly exposed to global risks.

The Fund's analysis needs to be better focused on the big global issues, including financial issues and on the interactions between different regions and countries. This means devoting more effort to analysing multilateral issues and to integrating bilateral and multilateral surveillance; and it means being ruthlessly selective in dealing with structural issues, by testing their relevance to external stability. It also means putting more emphasis on the surveillance of those countries with the most potential to create waves in the international monetary system.

Finally, the relatively puny effort devoted to multilateral surveillance is not having enough influence on members' policies. According to the Independent Evaluation Office (IEO) report published earlier this year, there is 'too much weight on providing information on economic developments and too little on analysing economic policy linkages and identifying scope for collective action'. The Fund needs to make more of its presence at intergovernmental groups such as the G7 and the G20. And it needs to experiment with more flexible ways of exploring key policy issues with relevant groups of members, to add depth to the formal exchanges typical of large set-piece international gatherings.

After a couple of years debate, the prospects for achieving meaningful reform now look promising, following the Fund's Annual Meetings in Singapore. The agenda for reforming surveillance includes a new focus on multilateral issues, including global financial issues and a new procedure for multilateral surveillance. The Managing Director has launched a first round of multilateral consultations on global imbalances. These are a potentially important innovation in the way the Fund interacts with key policymakers, but as they are still under way, I shall not comment further.

Instead I want to focus on the other key area for reform, where there are some important outstanding issues. This is the work now in hand to clarify and update the operational guidance on surveillance, through a thorough review of the 1977 Decision

and by designing a new annual remit for surveillance. This is aiming to provide a clear, up-to-date set of guiding principles, and a firmer operational foundation for surveillance.

This matters because the Fund can only be effective in encouraging countries to fulfil their obligations if there is a clear and shared view of what those commitments are, and a coherent and transparent operational framework for assessing compliance. There also needs to be greater clarity about the Fund's obligations, and how it is to be held to account for fulfilling them.

## A new Surveillance Decision

The 1977 Surveillance Decision needs to be replaced by a coherent and comprehensive set of principles covering all aspects of the Fund's surveillance. A new Decision should start from the overarching objective to promote external stability. Consistent with this, it should shift the emphasis toward multilateral surveillance and the analysis of policy spillovers. And, unlike the 1977 Decision, it should cover both exchange rate policies and domestic policies insofar as they may affect external stability, rather than exchange rate policies, *per se*.

This is a key area where the consensus has moved on since the late 1970s.

It is now well recognised that exchange rate policies cannot be divorced from domestic policies. Where exchange rates are allowed to float freely, the paths they take will be affected by a wide range of domestic factors, including both monetary and fiscal policies. These policies can have significant foreign exchange and spillover effects even when they are not implemented for an explicit balance of payments purpose. But even where nominal exchange rates are pegged, competitiveness and hence trade flows depend crucially on relative inflation rates, which reflect domestic monetary and financial policies. So both the effects of a fixed exchange rate, and questions about whether such a peg is sustainable at a given level, depend fundamentally on other domestic policies.

In short, what is now needed is a new Decision which will provide a comprehensive framework for surveillance; which will approach members' obligations explicitly from the perspective of external stability; and which will do so in terms which can readily be made operational. And it must be written in clear and unambiguous language.

This is a tall order I know — so here are some suggestions.

One very simple way of keeping surveillance focused would be to include a 'selectivity principle' in a new Decision. This would say that the scope of all surveillance activities should be based on their relevance to external stability: and that what

matters is how a member's policies could affect the rest of the world.

The most difficult challenge will be to state members' commitments in terms that are both general enough to take account of their very different economic circumstances, and specific enough to provide a clear focus for IMF surveillance. Striking the right balance is essential if a new framework is to provide a useful basis for assessing industrialised countries, emerging markets, and developing countries alike in a way that will be accepted as even handed.

A good way of meeting this challenge would be to ground surveillance in a more structured analysis of the policy frameworks which countries themselves choose to adopt. The Fund could then focus on identifying areas where a member's policy frameworks might be unsustainable or inconsistent with external stability, and then offer policy recommendations tailored to the circumstances of the country or countries concerned.

How might this work in practice?

Member countries would each provide a systematic description of their chosen policy frameworks in key areas — relating to monetary, fiscal, financial, and exchange rate policies. For these purposes, a policy framework is just a more or less formal description of a country's policy objectives and the policy instruments that have been assigned to meet them, including any policy rules, targets or strategies that may be used as a guide to decision-taking.

This approach would exploit the Fund's already significant access to information about members' policy frameworks, and if necessary its power to request more. And it would also avoid prescription and explicitly recognise members' undoubted right to choose their own policy frameworks, providing that they are consistent with their commitments under the Articles.

Given this starting point, Fund surveillance could then focus on two key sets of issues.

First, is an individual country's set of monetary, fiscal, financial, and exchange rate frameworks internally consistent?

The key questions would be: is this a sustainable approach to policy? And is policy being implemented in a way which is consistent with the stated framework? Taken together are the policy frameworks adopted by a member consistent with its obligations under the Fund's Articles, including the member's overarching commitment to collaborate with the Fund and other members to assure external stability?

The Asian crisis of the late 1990s illustrates the problems that can develop from internally inconsistent financial and

exchange rate policies. There were fundamental inconsistencies between rapidly liberalised capital accounts, still underdeveloped financial systems, and pegged exchange rates. This led to excessive investment through financial intermediaries, and the accumulation of a great deal of foreign currency debt, much of which was unhedged. When the full extent of this vulnerability became apparent, there were full-blown currency and financial sector crises.

Second, are different countries' policy frameworks consistent with one another?

If different members' policy frameworks are inconsistent, this could inhibit external adjustment, and pose a potential threat to external stability. So the key area for multilateral surveillance would be to identify where different countries' policy frameworks might conflict with one another and to propose remedies before this threatened the stability of the international monetary system.

You can argue that inconsistent policy frameworks lay at the root of the European Exchange Rate Mechanism (ERM) crisis in 1992. German monetary policy successfully targeted domestic price stability. The United Kingdom was pegging its exchange rate to the Deutschmark in order to import this stability. But when the Germans adopted a new approach to fiscal policy, running a structural deficit to finance infrastructure investment in the east — essentially adopting a new fiscal policy framework — German interest rates had to rise to keep domestic inflation in check. But keeping UK interest rates high enough to maintain the exchange rate would have been very contractionary. Arguably, the UK and German policy frameworks had become incompatible. Something had to give — in this case sterling's membership of the ERM.

This analysis of policy frameworks would help to focus bilateral surveillance, and provide a better basis for multilateral surveillance, and for integrating the two. It should throw up issues that could be pursued either with individual members or broader groups as appropriate.

## An annual remit

Better guidance for Fund surveillance should be buttressed by strengthened accountability for performance. For this, we need a clearer definition of what the Fund's surveillance is expected to deliver. A good way of doing this would be to set an annual surveillance remit for the Fund's Managing Director — an idea endorsed by the IMFC last April.

There are a number of overlapping mechanisms for setting priorities and assessing performance which now operate across the broad range of the Fund's work programme, through the Executive Board. But a surveillance remit would provide a sharper means for holding Fund management and staff to account for their performance on this key aspect of their work.

Of course, it would need to work with the grain of the Fund's overall governance arrangements. This throws up two tricky issues. First, who sets the remit and how? And second, how is the Fund's performance to be evaluated, and by whom? These issues require detailed consideration, but let me offer a few thoughts.

First, the process for setting the remit probably needs to involve both the Fund's Executive Board and the IMFC: the Board, because it is the body formally charged under the Articles with the oversight of surveillance; and the IMFC, because of its heavyweight political composition. The involvement of the most senior policymakers matters, because by endorsing the remit they are effectively giving the Fund a license to discuss their policies. This is empowering to the Fund. One way for this to work might be for the Board to present a draft to the IMFC for discussion at the spring meeting each year, taking its cue from the IMFC communiqué issued the previous autumn.

Second, one obstacle to relying exclusively on the Executive Board to evaluate the Fund's performance arises from the position of the Managing Director, who is both Chair of the Board and Head of the Fund Staff. But the MD's position is embedded in the Articles and raises much wider issues of governance. In the short term at least, this argues for giving a significant role to the IMFC.

Third, the technical challenges in assessing the effectiveness of surveillance are formidable. This points to giving an important role to the IEO which, since its foundation in 2001, has been building up relevant expertise in assessing various aspects of the Fund's work.

## How much difference can IMF surveillance really make?

This brings me to the crux of the matter: can IMF surveillance really make much difference, even if it is reformed in the way I have described?

It is important to recognise that surveillance — especially multilateral surveillance — is a very different kind of activity from the monitoring of reform programmes that may be linked to Fund financial assistance packages. Lending programmes have exerted considerable apparent leverage over countries' behaviour at least in the short term, through so-called 'conditionality'. In recent years the Fund's lending activities have gone into steep, and possibly irreversible, decline. But leverage of this kind has never been available to force policy change on countries who do not borrow from the Fund, a category which for the past 25 years has included all large industrialised countries.

The 'traction' of surveillance depends critically on the Fund's ability to influence the policies that countries choose to pursue. But is it realistic to suppose that the Fund can have any real influence over the countries whose policies matter most?

The Fund's constitution is cast in terms of the obligations that members owe to each other and to the Fund. Such obligations are not without legal content, still less without value. But the effectiveness of surveillance cannot rest on the strength or otherwise of any treaty-based sanctions that might be used against members who fail to meet their obligations.

The Fund's chief weapon is persuasion, exerted through a combination of channels: private advice, peer pressure, and public debate. But is this enough?

Excellent analysis can frame the issues that policymakers focus on; and it can shape and inform the public debate, domestic and international, that leads to action. Ideas and analysis, widely and well-communicated, can be very powerful in the modern world, especially in the largest democracies. As Keynes reportedly remarked, 'Ideas shape the course of history'.

The Fund can also facilitate dialogue between countries on issues where unilateral or even bilateral decision-making may not be the best way forward. On the biggest global issues, policies need to be designed with some depth of understanding about how others will act.

But ultimately much turns on members' confidence and trust in the Fund, and on the depth of their continuing commitment to its original first purpose: 'to promote international monetary co-operation through a permanent institution'. The support and commitment of those countries whose policies have the greatest impact on the world economy is clearly critical.

So the Fund's ability to shape and facilitate the debate is intimately bound up with its legitimacy. All countries need to feel they have a real stake in the governance of the Fund and an effective voice in shaping its activities and the decisions taken by its Board. This is why the governance agenda is so important and why there is a close link between the surveillance agenda and the second stage of quota reform.

The broader point is that everyone needs to have confidence that the Fund is fair and impartial in the way it goes about its work. Surveillance needs to be free from any perception of bias if it is to be credible. This is sensitive territory. Members are prohibited from attempting to influence staff as they discharge their functions. But present arrangements offer plenty of scope for misperceptions. There is a fuzzy boundary between legitimate concern for the quality and relevance of

surveillance and improper pressure on staff to fudge difficult issues or water down unpalatable conclusions. A surveillance remit would clarify the boundaries between staff and members without sacrificing accountability.

The role and performance of the Executive Board is clearly a critical issue. Putting to one side the long-running debate about the case for shifting to a non-resident Board, there is ample room for modernisation and improvement. Could the conflicts inherent in the MD's dual role be more transparently managed? And could the Board refocus its own efforts to better support the wider surveillance agenda? Last year, for example, it spent just 5% of its time mulling over multilateral surveillance issues — at a time when global imbalances and energy prices were headline news.

Finally, reform is a process not an event. The structure, processes, incentives and culture of an organisation whose core activity is surveillance are likely to be significantly different from one whose primary focus is on lending to countries confronting financial crises. Like many other organisations facing major change in its core business, the Fund will need to be sure that everything it values and rewards is tuned to support its new priorities.

## Conclusion

Over the past fifteen years, the Great Inflation that followed the end of the Bretton Woods system has been replaced by the Great Stability. Globalisation has brought great benefits, but it is creating major challenges for policymakers.

How will such issues be handled in future?

The Fund certainly has the potential to act as an authoritative medium for international monetary collaboration, providing its surveillance activities are re-focused on external stability and the big global issues. The Managing Director's current reform agenda is on the right lines. But the Fund's effectiveness in promoting international monetary stability will depend critically on the organisation's stature as a trusted and respected source of dispassionate analysis and impartial advice. And it will rest above all on the willingness of its members — large as well as small — to use it as their instrument to improve the quality of their own policymaking.

Equipping the Fund with its own version of Hawk-Eye will not be enough. In the end it will be down to them — or more accurately, us.

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# The puzzle of UK business investment

In this speech,<sup>(1)</sup> Sir John Gieve, Deputy Governor and member of the Monetary Policy Committee, discusses the possible reasons behind the relatively low level of British investment in recent years — including that the figures are misleading, companies are facing financial constraints or finding investment is not profitable and rapid globalisation — but confesses that it still remains a puzzle. He concludes the speech by noting the more recent upturn in investment in the first half of the year, and how this was one of the factors behind his decision to vote for a rise in the Bank Rate by 25 basis points to 4.75% in August.

Vice Chancellor, Ladies and Gentlemen, it is a great pleasure to be speaking to you this evening at the University of the West of England.

The Bank's connection with this region has been a long one. Our Agents have been working here since 1827, when the Bank first established a role in the regions to distribute banknotes and gather intelligence about business and economic conditions.

A great deal has changed in Bristol and its economy since then. But we retain close links with the area. Our Agent, Kevin Butler, and his deputy, Geoff Harding, meet up to 100 contacts a month in order to chart economic developments in the South West. I know many of you are involved in that process and I assure you that the insights you and others provide are an important part of the MPC's monthly deliberations on interest rates. Thank you for your help.

I want to talk today about the current state of our economy and in particular to discuss the puzzle of British investment.

The two are of course related. Investment is an important component of demand on our economy's resources, accounting for about a fifth of total demand. But it is also an important determinant of supply. Investment adds to the capital stock which determines how much we can produce. Provided it is well directed, the more we invest, the faster output can grow without putting upwards pressure on inflation.

As far back as I can recall, governments and commentators have been concerned by the relatively low level of investment in the United Kingdom. The 1960's National Plan was designed to raise it; all the parties in the fractious 1970s, when I started

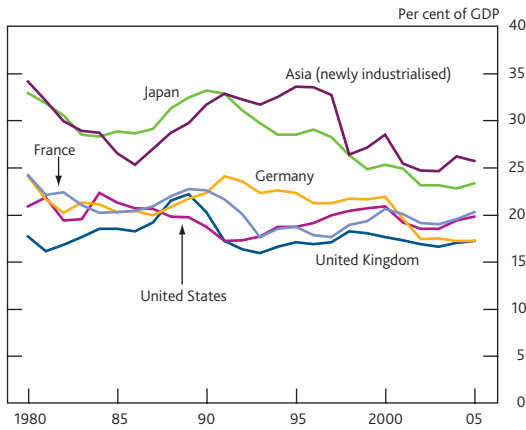
work in the Treasury, saw it as a major drag on our growth and a reason for our lagging behind our competitors in America and Europe. While the context has changed since then, low investment remains a concern to this day. For example, in its most recent report on competitiveness, the DTI concluded that 'the UK still has low levels of business investment, which hinders productivity and growth'.<sup>(2)</sup> **Chart 1** shows how investment rates for the United Kingdom have tended to be below those in the United States, France, Germany and Japan over recent years. **Chart 2** shows how this is reflected in a lower ratio of capital to output in the United Kingdom.

**Chart 3** shows very clearly the booms and busts of the early 1980s and early 1990s. Twice business investment seemed to take off only to collapse again as economic policy tightened. More recently, in the late 1990s investment increased very sharply, especially in IT and communications equipment. This was the time of the Dotcom boom and fears about the millennium bug. When the boom burst and the millennium passed without disaster, investment fell back in many countries, including the United Kingdom.

In the 1970s and 1980s, of course, it was natural to attribute the low levels of investment in the United Kingdom, at least in part, to instability in the economy. With big fluctuations in inflation, interest rates, exchange rates and growth, it did not seem surprising that businesses were wary of investing heavily in long-term capacity. Alongside microeconomic policies to encourage investment, governments in those decades all wished to establish a stable pattern of growth and inflation which would give business the confidence to invest.

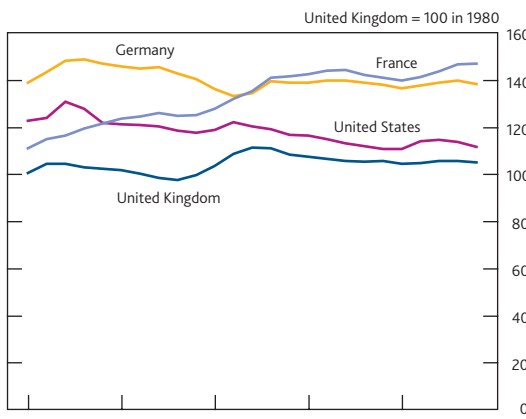
(1) Given at the University of the West of England on 26 September 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech282.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech282.pdf).  
 (2) Page 15 of DTI 'UK productivity and competitiveness indicators 2006'.

**Chart 1** Whole-economy investment in different countries (nominal)



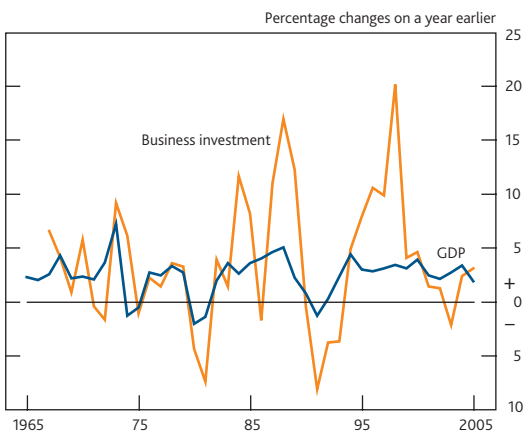
Source: IMF, September 2006 *World Economic Outlook*.

**Chart 2** Capital stock/GDP ratio (2002 prices)



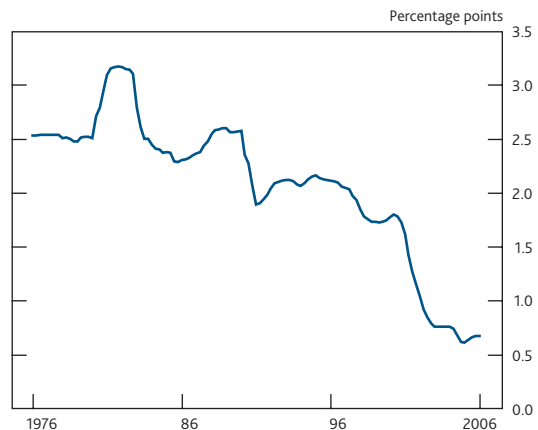
Source: Groningen University Growth and Development Centre data set.

**Chart 3** UK business investment and GDP (chained-volume measures)



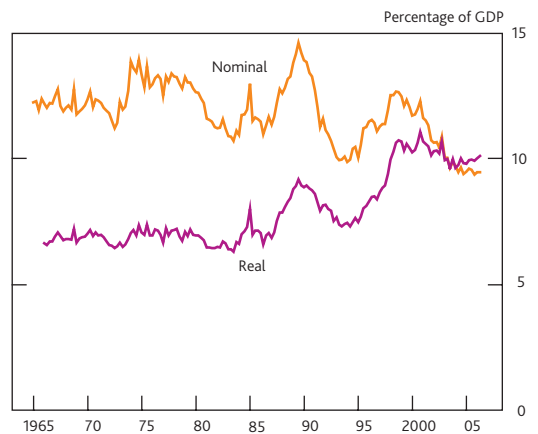
And that brings me to the puzzle. Since 1992, when an explicit target for inflation was introduced, the economy has been much less turbulent (**Chart 4**). To anyone, like me, who lived through the booms and busts of the previous decades, this remarkable stability and steady growth has looked like a golden age. In the past three years, with the United Kingdom

**Chart 4** Macroeconomic volatility in the United Kingdom (1976–2006)<sup>(a)</sup>



(a) Rolling ten-year standard deviations of UK GDP growth.

**Chart 5** UK business investment



having suffered less than most economies from the post-millennium hangover, we have been benefiting from the strong recovery in the world economy. Yet in 2005, business spending on investment in the United Kingdom was at its lowest relative to whole-economy income since 1965, when official data were first collected<sup>(1)</sup> (**Chart 5**). So what is going on?

As usual in economics, a number of explanations have been put forward — first of course the figures may be misleading, second companies may be facing financial constraints or finding that investment isn't profitable enough in the United Kingdom, and third the rapid globalisation of the world's economy may be channelling investment elsewhere.

**Measurement issues**

There are a number of measurement problems and official data almost certainly are understating actual spending on

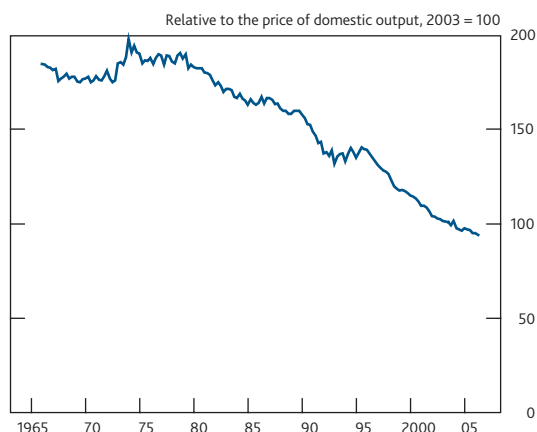
(1) The original published version of the speech referred to 1967, which is when volumes data were first available. Values data have been available from the ONS since 1965.

investment. In the summer the investment figures for past years were revised up and it would be no surprise if there were further revisions to come. Second, the official figures largely cover so-called tangible items, from the construction of factories, offices or shops to the purchase of vehicles, computers and telecoms equipment. It includes only some spending on intangibles and even those, notably software, are known to be underrecorded. Other countries face similar measurement difficulties of course but to the extent that the UK economy has a high service share in GDP, this factor may help to explain some of the gap.

I might add that the investment figures do not cover research and development or expenditure on re-engineering business processes or investment in human capital, like staff training. But again this is true internationally and I don't think there is evidence that we are investing unusually heavily in these areas — in fact management failures and poor skills and training are sometimes cited as explanations of the low rate of investment.

Lastly, we need to look not just at what is spent on investment in cash but what it buys. The price of many investment goods has been falling (**Chart 6**), so companies have been getting more for their money. In particular, each new generation of IT is far more powerful than the last but it is cheaper too. In other words, businesses in the United Kingdom have been keeping up the volume of investment, but because of price falls, they haven't had to spend so much.

**Chart 6** The price of investment goods in the United Kingdom



But if the real level of investment has been higher than it appears in the United Kingdom, other countries too have benefited from the global fall in the prices of capital goods. Indeed you might have expected a fall in the relative cost of capital goods to lead to a larger increase in the volume of investment.

So while the official figures may understate our level of investment, it seems unlikely that the difficulties in measuring

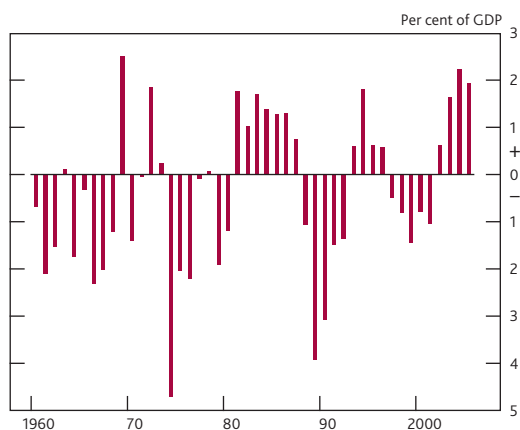
investment fully account for the relatively low rate of investment in the United Kingdom.

## Corporate finances and profitability

A second possible solution to our puzzle could be that either corporate finances have been constrained or returns on investment have been inadequate.

Certainly the surge in investment in the late 1990s was funded in part by a sharp rise in corporate debt which rose to record levels relative to corporate valuations. But since then, the corporate sector has held spending in check, relative to profits. So by 2004, non-financial corporations enjoyed the largest financial surplus relative to GDP since 1969, and high surpluses have continued since then (**Chart 7**).

**Chart 7** UK non-financial corporations' financial balance (nominal)



One recent concern is that funds may have been diverted from investment to finance pension fund deficits. In 2005, companies made one-off payments of almost £11 billion to reduce pension deficits, five times more than payments in 2001. In a recent survey of Bank contacts conducted by our Agents, we found little evidence of that in aggregate, although a fifth of small firms expected there to be some impact on their investment plans. Moreover, the strong overall corporate financial position and the ready availability of lending should mean that one-off cash-flow pressures should not prevent the financing of productive investment. There is no shortage of cash available to companies at the moment. Indeed the cost of borrowing has rarely been lower.

One of the most striking features of the world economy in recent years has been the very low rates of interest both in real and nominal terms. I don't just mean short-term interest rates, but also long-term bond yields. Some, including the Chairman of the Federal Reserve, Ben Bernanke,<sup>(1)</sup> have

(1) Bernanke, B (2005), 'The global savings glut and the US current account deficit', remarks at the Homer Jones Lecture, St. Louis, Missouri.



attributed that to a global savings 'glut', which should stimulate investment. But others, including the IMF,<sup>(1)</sup> suggest low interest rates actually reflect a lack of investment opportunities across the world.<sup>(2)</sup>

So is the problem on the other side of the calculation — namely that UK investments do not offer a high enough return? The evidence here is that, if anything, the achieved rate of return on investments in the United Kingdom has tended to be higher than in other advanced countries.<sup>(3)</sup> That might indicate that the financial hurdle rate for UK investments has been higher than in some other countries, which has choked off some investment. However, as the financial market becomes increasingly global, I would expect any differences in national, risk-adjusted hurdle rates to disappear. As I have said, in recent years, it is not obvious that UK investment has been depressed by a shortage of available funds.

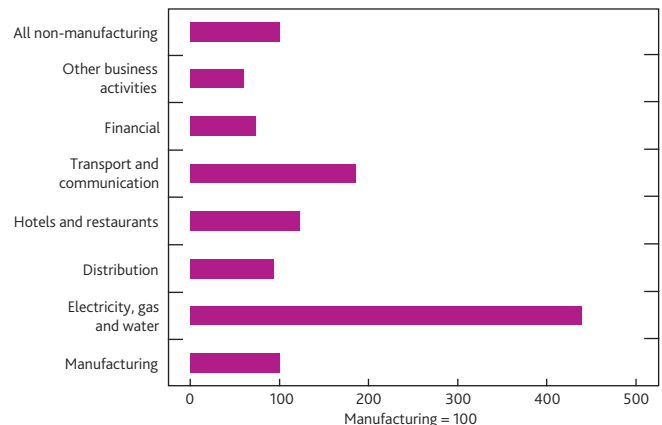
## Globalisation

Finally, could globalisation have been depressing UK investment? We frequently hear from large businesses that they are rebalancing their investment programmes not just to take advantage of lower costs abroad but to get closer to the strong growing economies in South East Asia and elsewhere. And UK companies and investors do tend to be particularly outward looking. Certainly, relative to other large advanced economies, the United Kingdom has a disproportionately large stock of overseas investments.<sup>(4)</sup>

But we should bear in mind that globalisation has also created very lucrative opportunities in the United Kingdom. Despite increased outsourcing of production, more people are employed in the UK economy than ever before and some of our sectors — finance for example — have been expanding rapidly as markets have become genuinely global. It is true that as a result of competitive pressure, the manufacturing sector has continued to decline, relative to other sectors. But the service sector has been thriving. It is often suggested that business investment will be depressed as we move out of manufacturing and towards services. But that assumes that manufacturing is more capital intensive than the service sector and the facts do not bear that out (Chart 8).

Globalisation has also been a strong force driving inward investment in the United Kingdom. You may have read that in 2005 we received more inward investment than any other country, including China or the United States. Now our position was flattered by the inclusion of purchases of UK companies by foreign companies and in the 2005 figures by the restructuring of Shell. Nonetheless we were indeed the location for many greenfield investments.

**Chart 8** Capital to output ratios in different sectors in the United Kingdom in 2004



## Conclusions on investment

I confess I remain puzzled. The macro environment has never been more stable. Companies have been achieving high rates of return on their investments in the United Kingdom, and finance is readily available. For some years the United Kingdom has had a low capital stock per worker relative to most similar economies and — in a truly global market — we might expect that gap to narrow. It is difficult not to think that opportunities are there and in time we will see the long-awaited sustained recovery in investment.

## Monetary policy

It is against that background that we have had an upturn in investment in the first half of this year. Could that be the start of a long-term increase? And what implications does that have for monetary policy?

First, while investment offers the prospect of greater prosperity tomorrow, it is one source of pressure on demand for resources today. So if we are to find room for more investment without putting too much pressure on resources we will need to see a rebalancing of demand. On the MPC we have only one instrument so we have to focus on the overall pressure of demand; we cannot determine the balance between consumption and investment however desirable that may be. The best we can do is to aim to keep inflation stable. In doing so we can reduce uncertainty among decision-makers in industry and services and allow them to focus on the big

(1) IMF (2005), 'Global imbalances: a saving and investment perspective', Chapter 2 of *World Economic Outlook*.

(2) Of course the imbalances appear at different levels in different economies — our savings rate is currently 15% and investment 17%; compare that with China where investment is around 40% and savings — mainly by households — is several points higher.

(3) Citron, L and Walton, R (2002), 'International comparisons of company profitability', *ONS Economic Trends*, No. 587, October.

(4) See for example, the statistics supplied by the United Nations Conference on Trade and Development ([www.unctad.org/Templates/Page.asp?intItemID=3277&lang=1](http://www.unctad.org/Templates/Page.asp?intItemID=3277&lang=1)), which shows that the UK stock of FDI was equivalent to 65% of GDP in 2004, compared to an average of 27% for all developed economies.

decisions they need to make, without being misled by sharp changes in prices.

The stronger growth of investment in the first half of the year was one of the factors behind the MPC's decision to raise the Bank Rate by 25 basis points to 4.75%. I voted for that increase for two main reasons. First, the accumulating news through the summer showed that the United Kingdom's recovery from the downturn in 2005 was well established and the doubts about that recovery had been allayed. Second, with CPI inflation above target and with signs of inflation expectations creeping up, I thought it was a good time to send a signal of our determination to bring inflation back to target well in advance of the coming pay round.

As to the future, the central projection of inflation that we published in August showed it rising at the end of this year and falling back to target by 2008, assuming that interest rates pick up to 5%. Most commentators are expecting us to raise rates again — probably in November, the next month we revise our forecast.

But in practice the real world rarely does follow the central forecast precisely. There are many uncertainties in the outlook — from the strength of the US economy as the housing market turns down, to the future of oil prices, or at home, how the growth in the labour force will affect wages and unemployment, and — as I have been discussing today — whether the recent upturn in investment will persist. We will learn a little more on all these issues in the coming weeks and months.

That is why, as Mervyn King has explained, the MPC makes its decisions one month at a time and is therefore very wary of giving forecasts of our own future behaviour.

What we can commit to is doing whatever we can to maintain the remarkable period of economic stability since inflation targeting was first adopted and to keep inflation low and close to 2%. That is what we can do to provide an environment in which businesses will have confidence to invest where they believe it will bring a return.

# Hedge funds and financial stability

In this speech,<sup>(1)</sup> Sir John Gieve, Deputy Governor responsible for financial stability, discusses how the rapid growth of hedge funds forms part of a wider transformation in financial markets. He notes that in the long run this should help widen the range of options for investors and promote stability, although in the short run there are risks while the funds, other market participants and the authorities gain experience of new products and markets. He concludes that the FSA and other authorities, including the Bank, are alive to the dangers and are doing what they can to assess and mitigate the risks.

## Introduction

Hedge funds get a bad press. They often appear as the latest in a long line of financial demons — from the 'gnomes of Zurich' whom Harold Wilson blamed for the pressure on the pound in the 1960s, the asset strippers and property tycoons of the 1970s, Gordon Gekko and the 'liar's poker' players of the trading floors of the late 1980s, and Harry Enfield's 'loadsamoney' lads of the 1990s. The phrase 'hedge fund' can conjure up an image of secrecy, million dollar bonuses, and the mysterious world of mathematical models and offshore havens. On top of that they are often presented as a threat to financial stability and thus to the savings and prospects of 'real' workers.

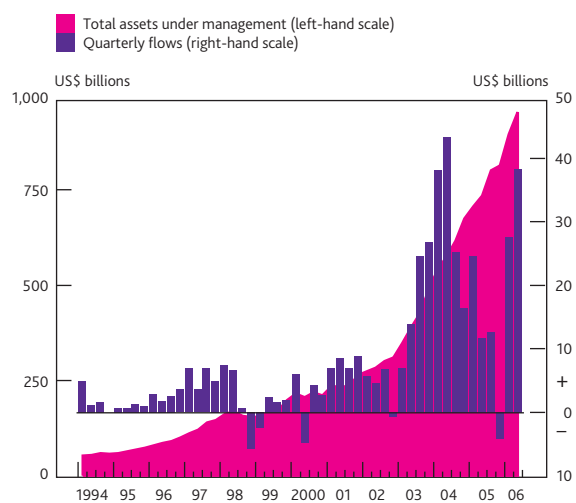
But despite, or possibly with the help of, this commentary, assets managed by hedge funds have continued to grow strongly. They have moved on from being the province of rich professional investors to collecting an increasing share of institutional funding. They may still have only a small proportion of total assets under management but they are growing fast and their leverage and active trading strategies make them very influential in many markets — traditionally in equities, but more recently in new structured credit markets. And of course, while they may be worried by the growth of hedge funds and modern financial markets, most other cities and countries are deeply envious of London's place as the location of choice of such a high proportion of hedge fund managers.

So I'm pleased to have the opportunity today to set out our assessment of how the growth of hedge funds is affecting the financial system and risks to financial stability.

## Hedge fund industry

But I'd like to start with the question why — why have hedge funds grown so rapidly in the past few years? After all they have been around since Alfred Winslow Jones set up the first long short equities fund in 1949 and there has been a steady development of the sector over the intervening decades with a growing variety of styles, strategies, sizes and status; hedge funds are like a family — you can see the resemblance without finding a single common feature. But the recent growth of the hedge fund sector has been explosive (**Chart 1**) with assets growing from around \$200 billion in 1998 to about \$1<sup>1</sup>/<sub>4</sub> trillion today.<sup>(2)</sup>

**Chart 1** Size of the hedge fund industry<sup>(a)</sup>



Source: Tremont Capital Management, Inc.

(a) Sample does not cover the entire industry.

(1) Given at the HEDGE 2006 Conference on 17 October 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech285.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech285.pdf).

(2) Note that **Chart 1** does not cover the entire hedge fund industry.

Part of the answer is the growing power of technology and financial theory to unpack traditional investment products, like equities and bonds, into their component parts and then sell them separately or in new bundles which may appeal to particular groups of investors. This has increased the opportunities for specialisation. So the growth of hedge funds is one aspect of the technological revolution which is also transforming the structure of other industries from manufacturing to entertainment.

The technology has allowed a ferment of financial innovation and put a huge value on the relatively few people who can understand and handle the growing complexity of markets. It is no surprise therefore that some of those people have seized the opportunity to take the rewards of ownership by setting up on their own. This was perhaps encouraged in the early days by the fact that the expertise lay mainly on the trading sides of the banks on the other side of the Chinese walls from the investment managers. The hedge funds are something of an investment bank diaspora.

Of course the banks are responding to the loss of key staff and expertise by establishing their own internal hedge funds or adding hedge funds to the range of investments offered by their asset management activities. They have the resources and breadth and depth of market penetration to be formidable competitors to the independent funds as asset managers. On the other side of course, in their role as prime brokers, the investment banks have benefited hugely in terms of fees, interest and the trading income generated by the active management of hedge fund portfolios. It will be interesting to see how the balance shifts in the coming years. I would be surprised not to see a rationalisation into a smaller number of large, independent funds with a shift of business back into the big institutions as the new markets and products become more familiar. This is what we have seen elsewhere in the financial sector and in other industries.

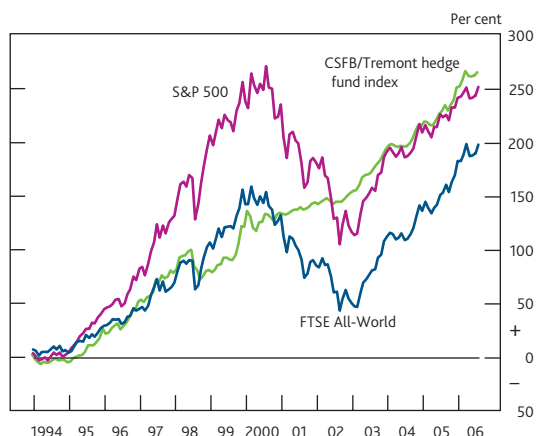
## Hedge fund performance

Finally, of course, hedge funds have been growing because they have offered attractive returns at a time when there has been a search for yield across the major markets and when, partly as a result of the greater sophistication of capital markets, long yields in particular have been low worldwide.

At risk of some caricature, it seems to me that the sector has been using two rather different sales pitches.

One is the offer which matches the name: the claim that funds can provide average returns comparable with those of an index but without the index's volatility.

Chart 2 Cumulative returns since 1994



Sources: CSFB/Tremont, Datastream and Bank calculations.

Chart 2 seems to provide some support for this. It shows if you had placed money with a representative group of hedge funds in 1994, regularly switching your allocation across different hedge funds exactly to follow that of the sectoral composition, you would have matched the cumulative appreciation of the world equity index but in a way that largely avoided the collapse in equity prices in 2000–02. So the risk-adjusted rate of return, even net of the fees, may have been higher. I should caution that this analysis ignores the survivorship and other biases associated with the construction of hedge fund indices so getting this ideal result would have been much harder than it looks.

More recently the emphasis has been on the ability of hedge funds to achieve 'alpha'.<sup>(1)</sup> This is a braver claim and the record is less clear. The position of hedge funds may have been aided by the restrictions on the types of product that can be marketed to retail investors. In that sense, while the derivative markets are highly competitive they have not been completely free and there may have been a premium for hedge funds and their professional investors.

But for the longer term, I must admit I am a sceptic. While a few investors or funds can consistently beat the markets, there seem reasons to doubt whether the whole sector can deliver superior risk-adjusted returns, especially as the rest of the market catches up with the financial innovations they have led and as they grow to become much more than marginal players.

Indeed, this search for investors' Holy Grail may go some way to account for the surge in births and closures among hedge funds with, according to Hedge Fund Research, over 2,600 new starts since the beginning of 2005 but with nearly 1,100 closures, double the rate of 2004.

(1) The abnormal rate of return in excess of what would be predicted by an equilibrium model like the Capital Asset Pricing Model.

## The impact of hedge funds on the financial system

What does the growth of the hedge fund sector mean for the stability of the financial system?

In the Bank's previous *Financial Stability Report (FSR)* in July we identified six main sources of vulnerability in the financial system and the growth of hedge funds was not one of them — nor, I believe, would it have been in the next six. That doesn't mean they are not important. They are mentioned 40 times in the *Report*. And our market intelligence function has developed regular and frequent contacts with several of the large funds and many of the prime brokers in London, the United States and Asia — and we are very grateful for the time they give us.

From a systemic point of view what matters is the wider change hedge funds are part of and the different incentives and behaviour to which that gives rise. In many ways the growth of hedge funds and the derivative markets they feed off is part of a shift from bilateral negotiated banking finance to arms-length finance through asset markets.

In the long term, that shift should be good for stability. What has traditionally worried central banks and regulators most is the risk that the key intermediaries at the centre of the financial system — especially the big banks — may fail in a way that sends shock waves throughout the system and damages the wider economy. The development of more sophisticated markets which allow these key players to transfer some of the risk that they have traditionally held on their own balance sheets is positive for the system as a whole. And what better place to put it than in a large number of independent funds financed by very rich individuals and professional investors, whose losses are of interest only to themselves, and in long-term investment institutions with highly diversified portfolios?

It is important always when assessing risks from a change in financial markets to remember the risks in the *status quo*. And the traditional world of vanilla products and national markets was not a haven of stability. In the early 1970s, for example, a surge of highly leveraged property investment was channelled through the United Kingdom's fringe banking sector. When their over-leveraged bets on real estate came to grief because of unexpected increases in interest rates, the large UK clearers had to step in through a Bank of England organised 'lifeboat' which amounted at its peak to about 40% of the large UK clearing banks' capital.

The active trading of hedge funds makes markets more liquid and facilitates genuine hedging activity by others — including systemically important banks. Increasingly, hedge funds — led

by those managed from London — have become an important part of the risk transfer process, providing liquidity to evolving structured derivative markets. So hedge funds have been positive for market efficiency. And in recent episodes of market stress — the autumn of 2003 and the spring of last year — some have helped provide liquidity to markets, enabling large banks and other investors to adjust their positions.

Of course at times of turbulence we have seen some hedge funds taking losses and facing liquidity difficulties, but we have also seen other funds stepping in to pick up the assets as prices fall and thus to provide liquidity to the market. If we face a financial crisis in the next few years we are almost bound to find some hedge funds at or near the centre of it; equally we should expect hedge funds to play a part in providing the solution.

To complete the upside story, funds have not just been a source of financial innovation but some have been pioneers in risk management and have helped make the industry more resilient — for example through participation in the Corrigan Group.

## Challenges to systemic stability

But if the growth of hedge funds is part of a helpful structural shift in the long term, any major change brings transitional risks and problems. Periods of rapid growth and innovation in financial markets have often led to difficulties and overshooting and we should not assume that this one will be different.

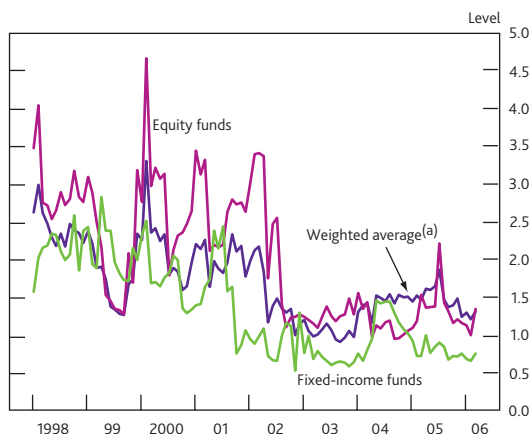
The LTCM episode of course demonstrated the risks. The problems in a large and exceptionally highly leveraged hedge fund threatened widespread market dislocation and large losses for other institutions. The fund flipped from being a liquidity provider to a liquidity demander.

A great deal has changed since then of course. The sophistication of the risk controls in prime brokers and in many hedge funds has been hugely improved, and 1998 and the collapse of the high-tech stock prices in 2000 form part of regular stress tests throughout the financial sector. Recent events suggest that the financial system may genuinely have become more resilient.

It would be difficult to speak about hedge funds at the moment without referring to Amaranth. What should we make of the fact that this fund incurred enormous losses and yet left markets largely unmoved? Can we put the apparently limited collateral damage down to much improved counterparty risk management since 1998? Or were we just lucky?

I suspect the answer is a bit of both. I don't have full details of what went wrong or how much the fund's several prime brokers knew about the fund's overall exposure and leverage. But while Amaranth had leveraged up, it had not done so — or been allowed to do so — on the scale seen at LTCM and that lower leverage has been seen across the market (**Chart 3**). The fund was able to meet its margin obligations without dislocating markets and other players were willing to step in and liquidate its positions — albeit on terms which shocked the Amaranth management.

**Chart 3** BIS indicators of hedge fund leverage



Source: Bank for International Settlements.

(a) Includes equity funds, market neutral funds, directional funds, fixed-income funds, and fund of funds.

Incidentally that shock at the way markets moved so aggressively against their positions was a common feature of LTCM and Amaranth's experience and it is an example of a trend which is not peculiar to the financial sector. In the past a failing firm could hope to get its bankers into a room and persuade them to put in more money or allow time for recovery (as the saying went, if I lose thousands of pounds it's a problem for me, if I lose billions of pounds it's a problem for you). I suspect those times are going: firms often don't know now who holds their shares and debt and many investors are looking to take the hit and get out as quickly as possible. This is a more brutal world to fail in.

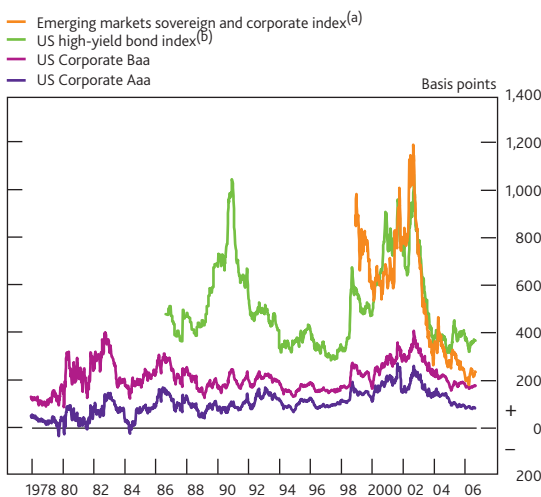
But another key difference from LTCM was that the market event that appears to have undone Amaranth — a fall in natural gas futures prices — could otherwise be considered a benign one for growth and inflation. In that respect it was very different from 1998 when Russia's default sent a shock through a wide range of markets. So while we can take some comfort from the fact that losses from Amaranth were limited by improvements in counterparty risk management, we should not conclude that it will be as smooth and easy next time — and of course there will be a next time.

The fact is the fantastic growth of derivative markets and hedge funds of the past few years has taken place in benign

times. The resilience of the valuations, the diversification of portfolios, the depth of liquidity, and firms' risk management has not been tested by a severe shock.

Our *FSR* identified the risk that the business pressure to maintain or establish market share in rapidly expanding markets might drive companies to take on more risk than they should. There is no reason to change that assessment now. Indeed, after a short pause in May and June, we have seen the return of aggressive risk-taking in many financial markets this autumn. There must be a danger that the search for yield is driving many investors into similar trades (or trades which would become closely correlated in a crisis) and that risk models are giving too much weight to the low volatility of recent times. For example, it is possible that positions are being built up, or only partially hedged, on the assumption that currently compressed corporate credit spreads will adjust moderately or smoothly. **Chart 4** shows that corporate high-yield markets have not behaved in this benign way in the past.

**Chart 4** Yield differentials with ten-year US Treasury bond



Sources: Bloomberg, Merrill Lynch and Bank calculations.

(a) Yield to maturity.  
(b) Monthly data until 1990, daily data thereafter. High-yield index shows the yield to maturity rather than the effective yield.

But I should not end on a gloomy note. Working closely together, the authorities — which in the United Kingdom means the Financial Services Authority (FSA), Bank of England and HM Treasury — are aware of these risks, as are the industry. And measures to address them are being taken. The second report of the Corrigan Group, unlike its predecessor, has been published to forestall, rather than as a reaction to, a crisis. The rating agencies are beginning to publish operational risk ratings for hedge funds and managers.

Complementing these industry initiatives, the FSA has been developing its approach to the regulation of hedge fund managers. It has set up a special unit to supervise hedge fund managers and ensure they are subject to the same standards

of market conduct, systems and controls as other asset managers and that potential conflicts of interest are addressed (for example in the area of asset valuations). It is encouraging further improvements in counterparty risk management practices by prime brokers. It has worked with the Fed in New York and the industry to significantly reduce backlogs in derivative confirmations and assignments. Its surveys of prime brokers' exposures to hedge funds provide an important guide to any developing concentrations or an excessive build-up of leverage. And today Andrew Shrimpton of the FSA is also here leading a business showcase session on material side letters. In these ways the FSA is seeking to ensure that proportionate regulation complements the disciplines provided by London's large and sophisticated market.

To sum up, the rapid growth of hedge funds is one aspect of a wider transformation in financial markets. In the long term there are good reasons to see this as welcome not just in widening the range of options for investors but in promoting the stability of the financial system. In the shorter term, there are bound to be risks while the funds, other market participants and the authorities gain experience of how the new products and markets behave in a full range of trading conditions. The FSA and other authorities, including the Bank, are alive to the dangers and are doing what they can to assess and mitigate those risks.

# Practical issues in preparing for cross-border financial crises

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In this speech,<sup>(1)</sup> Sir John Gieve, Deputy Governor for financial stability, discusses the challenge that globalisation poses for handling and resolving financial crises. He argues that the machinery for co-operation between authorities has not kept pace with the internationalisation of markets, and suggests that a practical way to improve co-ordination is through discussion of operational issues in small 'interest groups' of authorities with a mutual interest in specific financial firms and the capital markets in which they interact. He concludes that the Financial Stability Forum could draw out the common messages and lessons from these 'interest groups' and help to establish a common framework for handling cross-border crises.

## Introduction

My subject this evening is the challenge that globalisation poses for handling and resolving financial crises.

If that seems a typically gloomy subject for a meeting of central banks, regulators and finance ministries, I would like to start by emphasising two points. First, I do not believe that globalisation is a source of instability: indeed in financial as in other markets, the opening up of international competition has been a huge force for good, by spreading and diversifying risk, it has in many ways made financial markets more efficient and stable. However, the fact is that governments, regulators and central banks remain largely national and our machinery for co-operation has not kept pace with the internationalisation of markets.

Second, I have not chosen the subject because I believe a crisis is imminent. Indeed, in the United Kingdom and elsewhere economic and financial conditions currently are mostly benign and are forecast to remain so. Of course concerns about global imbalances and the search for yield in financial markets remain but our central projections like those of the IMF and most other international forecasters show the 'Great Stability' of the past ten years continuing at least in the near term. But remote events do happen — and by their nature we cannot always see them coming. Researchers at the World Bank have recorded thirteen borderline or full-blown financial crises since the late 1970s, involving at least one Financial Stability Forum (FSF) member country.<sup>(2)</sup> And there are well-known incidents not on the list: including the 1987 crash, the less-developed countries' debt crisis and LTCM's near collapse.

So we are fortunate in having a time of relative calm to work out together how we should react when a problem does arise.

And we have in the FSF a body that was established 'to co-ordinate the efforts of... various bodies in order to promote international financial stability, improve the functioning of markets, and reduce systemic risk'.<sup>(3)</sup> In its first seven years, much of the FSF's focus has been on the identification and assessment of risks in a rapidly changing financial system; it has played a valuable role in building a common understanding among authorities and among market participants of what the risks are and how they can be reduced. However, that level of progress has been less apparent on putting in place arrangements for handling and resolving cross-border crises.

During that period a number of countries, including the United Kingdom, have improved their processes for handling financial crises — including for crises sparked by business continuity events. And there have been a number of exercises and co-ordination initiatives in different regional groups (for example among the Nordic countries, Dutch and Belgian authorities, and more widely across the EU). But there has been less progress on the wider international front. Overall, I do not know anyone who believes that we have established either the common approach to crises or the practical machinery which would enable us to handle a complex cross-border failure with confidence.

I would like to make some suggestions tonight on how we might take matters forward.

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(1) Given at the Financial Stability Forum Workshop: Planning and Communication for Financial Crises and Business Continuity Incidents on 13 November 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech290.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech290.pdf).

(2) Caprio, G and Klingebiel, D (2003), 'Episodes of systemic and borderline financial crises', *World Bank Research Dataset*. <http://econ.worldbank.org>.

(3) [www.fsforum.org/home/home.html](http://www.fsforum.org/home/home.html).



## When and how should the state intervene to prevent or manage a financial crisis?

Of course the underlying questions are very difficult even for one country. Financial markets are often volatile and they can only work well if investors and firms expect to live or die by their own decisions and do not come to rely on a safety net to mitigate their losses. To avoid that 'moral hazard', authorities have tended to be reluctant to spell out in what circumstances and what ways they would be willing to help support a market or a participant, beyond making clear that it would only be in exceptional circumstances and where it was essential in the wider systemic interest. But the difficulty in spelling out underlying reasons must not become an excuse for lack of analysis and preparation. In order to make cross-border crisis management work, we may have to consider sacrificing some mystery — even if only among ourselves — for greater effectiveness.

The most recent cases of official emergency liquidity support to UK banks occurred in the early 1990s, when the Bank lent to a few small banks in order to prevent wider loss of confidence in the banking system. The Memorandum of Understanding (MoU) between the Treasury, FSA and Bank which sets out our current roles in maintaining financial stability makes clear that decisions on support operations now rest with the Chancellor, acting in the light of advice from both the Bank and the FSA.

Following the early 1990s' experiences, Eddie — now Lord George — discussed various options for intervention.<sup>(1)</sup> He argued that, in deciding whether to provide support, the authorities should: explore every option for a commercial solution before committing public funds; structure any support such that losses would fall first to shareholders and any benefits fall first to the authorities; not, in normal circumstances, lend to a firm known at the time to be insolvent; and, look for a clear exit from provision of the lending.

These guidelines go more to the question 'how' rather than the question 'when' the authorities should intervene, and they were drawn up before the globalisation of banking and capital markets had got fully under way. So I do not put them forward as the complete answer; rather, I think we should be discussing whether there are some common understandings which could inform and shape cross-border co-operation.

### International complexity

Of course reaching a common view will be difficult. But it seems to me a necessary step towards meeting the challenges of handling financial instability in the new world of open international capital markets and giant complex financial institutions.

Many of the challenges have been discussed in the international community. In particular: the potential difficulty in amassing a complete picture of the health of firms and capital markets in crisis from different authorities; the potential complexity of large firm structures, where entities within a firm may be subject to different legal arrangements, preference rules and rules concerning ownership interests and creditor arrangements; and the possible technical difficulties in winding down an entity that is engaged in complex trading strategies. There are also of course issues around how liquidity and capital can be moved around a group: whether collateral, funding or capital can be moved quickly across borders to where it needs to be.

Further, some of the commonly preferred methods for resolving a financial crisis, before moving to winding-down methods, may be less easy to deploy than they were even a few years ago. I think many of us would share Eddie George's view that we should look first for a private sector solution before committing public money to a rescue operation. When LTCM got into serious difficulties in 1998, and there was a risk that its liquidation could further destabilise markets, the New York Federal Reserve was able to facilitate discussions that resulted in a co-operative market solution.

But would this kind of approach still be possible today? Certainly private sector solutions looked easier when lending was the predominant source of funds, banking systems were arranged predominantly along national lines, and it was possible to get the key counterparties round a single table. Will firms that have actively engaged in methods to lay off risk when a problem occurs — through, for example, credit derivatives and collateralisation — be as ready to contribute to solutions predicated on the give and take of long-term relationships? And will the increasing complexity and size of large complex financial institutions deter previously willing possible participants?

Since the FSF's creation, there has been further consolidation of international banking groups and globalisation of markets. Our vulnerabilities are more concentrated: although the firms and capital markets in which they are concentrated are probably more resilient, we have bigger and potentially more complex points of failure. This concentration has brought efficiencies, and has been supported by enhanced oversight of global firms and the capital markets they operate in. But the price we pay is more complicated (and therefore potentially more costly) crisis resolution.

(1) George, E (1994), 'The pursuit of financial stability', *Bank of England Quarterly Bulletin*, February, pages 60–66.

## A practical way forward

So how can we make more progress? I have spoken about drawing up a shared framework or set of principles but I am only too aware how easily that could become a drafting exercise in which difficult issues are evaded rather than dealt with.

Clearly initiatives such as this workshop are a useful way to bring relevant policymakers together — and I am encouraged by the shared commitment to make progress that you have shown by being here today.

My suggestion is that probably the best way of making further progress on a genuine and useful common approach is to work together on practical examples; to consider some of the operational problems that we would face if particular sorts of crises arose. And thus establish a shared fact base and understanding of what we might expect from each other in a crisis, and how we should go about handling it.

This idea of informal groups of relevant authorities is not new. In a sense, it is borrowed from the supervisory world, where colleges of regulators have existed for some time, with the aim of devising ways of pooling knowledge and developing common approaches — to supervise firms efficiently and to reduce the supervisory burden for them.

The groups to discuss crisis management issues would need to bring together supervisors and central banks. Both are likely to have day-to-day information which is relevant in a crisis, and both will also have control of tools which can be used to handle the problem. At the same time, the number of participants would probably need to be smaller than in a regulatory college if these groups are to be effective. To remain focused, the core group might perhaps need to be limited to authorities from two or three countries each, rather than wider groups.

And selectivity, flexibility and pragmatism would be absolutely key. I am not advocating, for example, that we form a group for every firm that includes all authorities in every jurisdiction where that firm has a presence. Instead, that we use a risk-based approach to concentrate on those authorities with a mutual interest, identify the specific firms and capital markets that that mutual interest might cover, and bring together those relevant authorities to discuss those firms and the capital markets they interact in. Indeed, some countries' authorities have already met bilaterally or in small groups to discuss crisis management topics of particular mutual interest.

There are a number of practical aspects of crisis management that these interest groups could enhance. First, co-ordination in a crisis. This, alongside information-sharing, is the area that has received most generic attention at the cross-border level.

Our challenge is to embed processes that will be relevant for crises into our everyday interactions: co-ordination is likely to be much easier among colleagues who are already familiar with each other and with each other's views and approach, than with someone who is simply a name on a contact list. This is one positive feature of discussing these issues, just as some of the value of MoUs lies in the process of negotiation and the relationships that fosters.

Second: information-sharing in a crisis. Interest groups would be a good forum to discuss in advance what information it might be appropriate to share on specific firms, and to ensure that it would in practice be readily available. And in doing so, we will better understand the information and therefore be able to assess it more quickly and more confidently in-crisis.

Third: in-crisis systemic impact assessment. A key first step in deciding how to handle a crisis is in understanding the likely cost of not intervening in it — the likely systemic impact of it. The impact of a particular problem or failure of a particular firm will of course depend on the characteristics of that specific problem — and importantly on the resilience of the financial system, and the interlinkages among different elements of it at the time. However, there are common channels through which shocks propagate. And some of those channels will be more relevant for particular firms than others. The important aspect of developing this work is in providing a common vocabulary in which policymakers can discuss the possible impact of a problem. This may also help to provide a framework for deciding whether to intervene in a crisis, as well as helping to understand who may be interested in intervening.

And fourth: the types of measures we have available in a crisis. I outlined earlier a number of challenges in resolving a crisis involving a large complex financial institution, and the obstacles we may face in addressing them. The Contact Group 2002 report on legal underpinnings<sup>(1)</sup> provided more detail on the extent to which different legal regimes created vulnerabilities in managing crises. Through discussion of hypothetical problems for real firms we may get closer to understanding more concretely what these obstacles will look like in practice and therefore what we might want to put in place to mitigate them. Put another way, it is potentially a way to develop practical solutions, or at least a practical understanding of the specific issues we might face, within the parameters of our current legal and fiscal set-up.

What we learn from firm-focused interest groups should also put us in a better position to tackle some of the thorny issues we face. One which particularly exercises me is ensuring that we should always have the option of closing down a large firm in an orderly way, even if we need to use emergency liquidity

(1) [www.bis.org/press/p021210.htm](http://www.bis.org/press/p021210.htm).

assistance as a bridging loan to do so (rather than as a step towards keeping the firm open).

Looking further ahead, it is clear that these interest groups should not remain inward-looking. In order for any preparations for crisis to be relevant, authorities will need to ensure that they are informed by firms' plans and views — for example on their likely own actions in crisis, where they see their vulnerabilities in managing a problem, what they expect the authorities to do, and where arrangements could be improved. So the ongoing dialogue that the relevant authorities have with firms may well inform, and be informed by, the work of interest groups.

What role could the FSF play in promoting these kinds of bilateral or small multilateral discussions and exercises on practical topics regarding specific firms and markets? As we all know, it is not the role of the FSF to manage cross-border crises. But my view is that the FSF does have a role in this area. To me it seems the ideal group to draw out the common messages and lessons that may emerge from these interest group discussions, and to establish a common framework for handling crises which will be of use both to its members and more widely.

# Reflections on my first four votes on the MPC

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In this speech,<sup>(1)</sup> Professor David Blanchflower,<sup>(2)</sup> member of the Monetary Policy Committee (MPC), sets out his reasons for voting against the August 2006 rise in interest rates. He explains that in his opinion the data available at the time of the decision were not indicative of a reduction in spare capacity in the economy, in contrast to the opinions of some of the other members of the MPC. He also sets out his belief that the risk to near-term spending growth from a weakening labour market outweighed the chance of greater spending growth stemming from too loose a policy stance.

I am particularly pleased to be in Wales for my first speech. The family on my mother's side came from Swansea. I have happy childhood memories of summers spent on the Gower coast particularly swimming in the cold sea at Oxwich, Caswell and Horton. My parents lived here for 40 years until they moved a month ago, much to my surprise as I had planned on staying with them tonight! I went to school in Cardiff at what was then Canton High School for Boys, now Cantonian High School, and had an inspiring teacher, John Kitchker, who first introduced me to the joys of economics at A-level. I returned to University College, Cardiff for my Masters degree in Economics some years later and even taught some classes at the Export Credits Guarantee Department across the road from the Economics Department. I also recall with pleasure several years as a junior member of Wenvoe Castle Golf Club where I first became addicted to golf. I am now a member of Royal Dornoch Golf Club in the north — Scotland to be precise! Anyway, I have many happy memories of South Wales and am pleased to be here today.

I have now been a member of the MPC for nearly four months and voted four times. In the first two votes in June and July of 2006, I went along with the majority of other Committee members in voting for no change. But in August I was the sole dissenting vote in what the Governor of the Bank, Mervyn King, described at the August *Inflation Report* press conference as a 'knife-edge vote'. I believe that is an appropriate characterisation: the vote for me was a very close-cut call, and principally came down to differences in views on the level of spare capacity in the economy. In this speech I aim to set out how I came to make my August decision, and my subsequent view of the economy.

The remit of the MPC is to control inflation — hitting the inflation target is our primary purpose. Subject to this goal, the Committee is also responsible for supporting 'the economic policy of Her Majesty's Government, including its objectives for growth and stability'.

The inflation target of 2% is expressed in terms of an annual rate of inflation based on the consumer prices index (CPI). The remit is not to achieve the lowest possible inflation rate. Inflation below the target of 2% is judged to be just as bad as inflation above the target. The inflation target is therefore symmetrical. Furthermore, a target of 2% does not mean that inflation will be held at this rate constantly. The MPC's aim is to set interest rates so that inflation can be brought back to target within a reasonable time period, without creating undue instability in the economy.

In order to achieve this goal, the MPC, along with the Bank's staff, spends a lot of time analysing and interpreting data. So, the big question is what was there in the data back in August that made the MPC move from a unanimous vote for no change in July to a six to one vote for an increase? The answer is principally twofold, reflecting concerns about the medium-term profile for inflation and the degree of spare capacity in the economy. I intend to talk about both these issues, starting with spare capacity.

Policymakers often gauge the extent of inflationary pressures in the economy by looking at the balance between the level of demand in the economy against the supply potential of the economy — the output gap, or the degree of spare capacity in the economy. The output gap is related to the unemployment gap, the difference between the natural rate of unemployment and the rate of unemployment itself. When unemployment is at its natural rate, there is neither upward nor downward pressure on inflation. Let's take an example where unemployment is at its natural rate, but firms put extra pressure on their workers to work longer hours or be more

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(1) Given at a breakfast with contacts of the Bank's Agency for Wales on 27 September 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech283.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech283.pdf).

(2) I am grateful to Lavan Mahadeva, Jumana Saleheen, Chris Shadforth and Nicola Dufty for their help in preparing this speech. I would also like to thank the Governor, Kate Barker, Charlie Bean, Martin Brooke, Andrew Holder, and Andrew Wardlow for their helpful comments.

productive. These firms may have to compensate workers for their extra hours and effort. This is an example of reduced spare capacity *within* firms, which can lead to inflationary pressures. So, one can think of the output gap as being the sum of two parts, the degree of spare capacity in the labour market (or the unemployment gap) and the degree of spare capacity *within* firms. I will use this simple framework to argue that I did not feel that there was any news in the data in August that convinced me that there was less spare capacity in the UK economy relative to July, in contrast to some of my colleagues.

Each summer, the Office for National Statistics (ONS) publishes revisions to its past estimations of national output, expenditure and income to reflect the receipt of less timely data. These latest estimates of annual economic growth show that the economy grew more strongly in 2003 and 2004 than estimated at the time of the *May Inflation Report* (Chart 1). The new data also imply that the slowdown in 2004–05 was more pronounced than previously reported, but that the recovery since then has been correspondingly stronger, although these data are subject to revision themselves. The revised level of output over the recent past could indicate that the economy is operating with less spare capacity than previously thought. Some external support for this view is provided by the upward revisions to both Oxford Economic Forecasting (OEF) and National Institute of Economic and Social Research (NIESR) output gaps between April and July (Chart 2).

A reduction in the output gap would be consistent with some tightening in the labour market or a decrease in the degree of spare capacity within firms — how hard firms work labour and capital. It could also be some combination of the two. So, what did these data say back in August?

### Wage pressures and spare capacity in the labour market

Turning first to the labour market, the unemployment rate had been trended up for some time (Chart 3) — which is evidence of loosening rather than tightening. At the time of my August decision the unemployment rate was 5.4% for the month of May, up from a low of 4.7% in August 2005. I note also that the unemployment rate in Wales, which was below that of England in 2005 Q1 (4.6% and 4.7% respectively) was above it in 2006 Q2 (5.7% and 5.5%).<sup>(1)</sup>

The claimant count had increased less dramatically, in part reflecting higher unemployment among more vulnerable workers who may not be entitled to unemployment benefits, for example younger workers, low-skilled workers and immigrants. This, together with some evidence of increasing durations of unemployment tended to suggest that the rise in

Chart 1 GDP

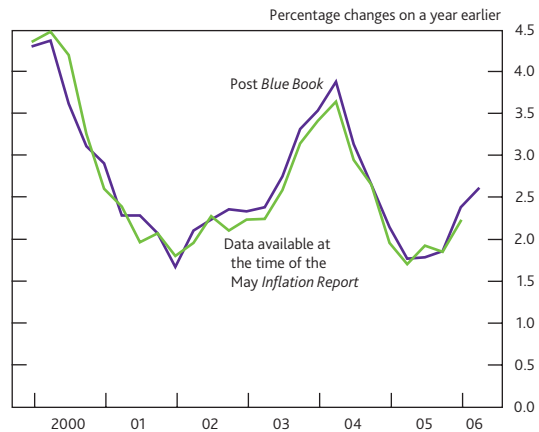
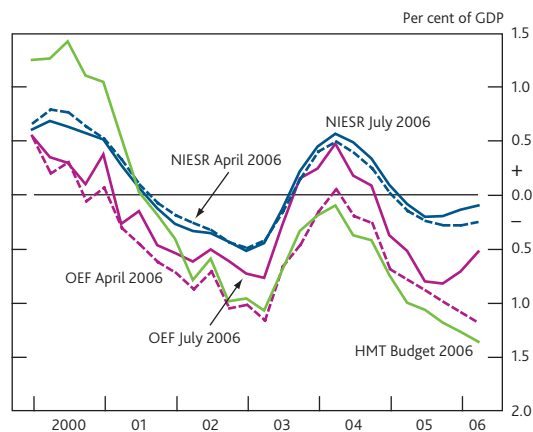
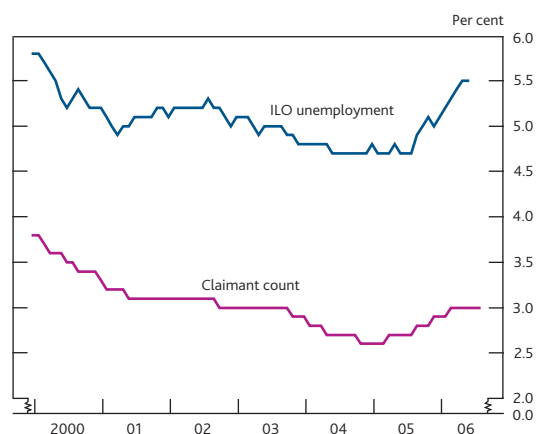


Chart 2 The output gap



Sources: HM Treasury, National Institute of Economic and Social Research and Oxford Economic Forecasting.

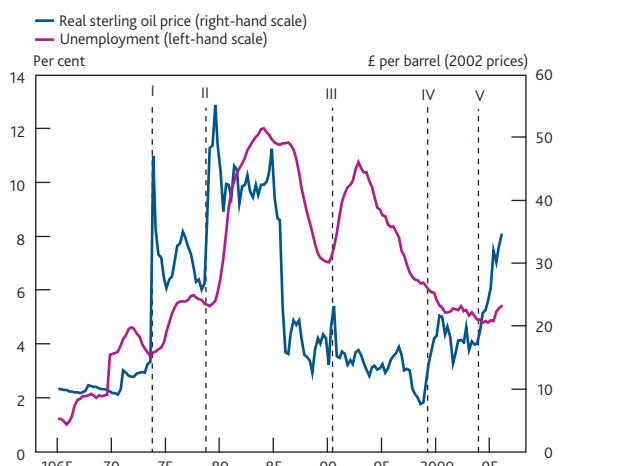
Chart 3 Unemployment and the claimant count



unemployment was primarily cyclical in nature, rather than structural. The reason why I believe it is cyclical is that one would expect the vulnerable groups in the labour market to be hit first by weaker labour demand. And we know that the average duration of unemployment is higher in periods of softer

<sup>(1)</sup> Source: StatWales. However, the Welsh outturn for 2006 Q2 looks somewhat volatile having been 4.7% in 2006 Q1.

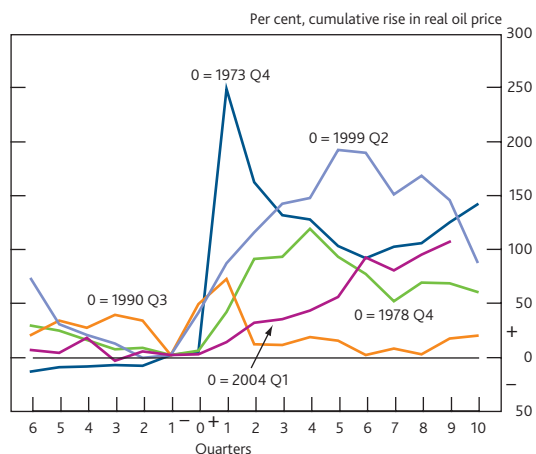
**Chart 4 UK unemployment and the oil price<sup>(a)</sup>**



Sources: Thomson Financial Datastream (US dollar exchange rate), IMF IFS (Brent Crude oil prices) and ONS.

(a) The vertical lines represent the five episodes during which the price of oil rose significantly. The measure of oil prices used here is the Brent Crude price series in US dollars taken from the International Monetary Fund's International Financial Statistics database. This has been taken back to the 1960s by linking it to the prices of similar types of crude oil. See International Monetary Fund (2005), *Country Notes*, page 6. The dollar price has been converted to sterling. When expressed in real terms, the oil price has been compared relative to the level of UK retail prices. I = 1973 Q4; II = 1978 Q4; III = 1990 Q3; IV = 1999 Q2 and V = 2004 Q1.

**Chart 5 UK real sterling oil price episodes**

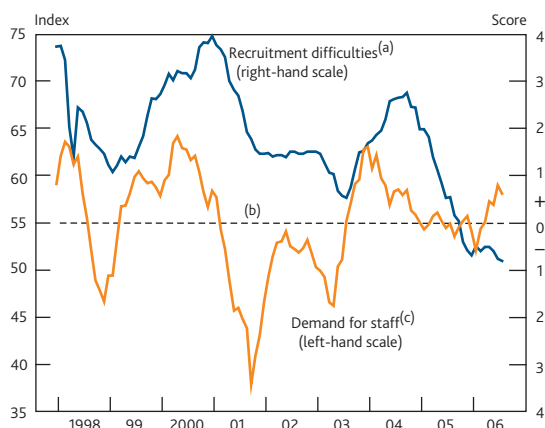


Source: IMF.

labour demand growth. But when forming my judgement about how the economy might evolve going forward it was important to understand why this change had occurred.

The degree of tightness in the labour market can be driven by factors affecting demand and/or supply. One explanation for the recent increase in unemployment might be the upward trend in oil prices over the past two years. An increase in the price of oil may lead firms to seek to rein in other costs, such as labour, or at least reduce their expectations of future recruitment. **Chart 4** shows that since 1971, there have been five episodes during which the oil price has risen significantly (detailed in **Chart 5**).<sup>(1)</sup> It shows that during the first three episodes, the oil price hike was followed by a recession: a sharp rise in the unemployment rate. But following episode IV, the unemployment rate was largely unaffected.

**Chart 6 Recruitment difficulties and demand for staff**



Sources: Bank of England and Recruitment and Employment Confederation survey.

(a) Recruitment difficulties are Bank Agents' scores. A score above zero implies employers are finding it more difficult than normal to recruit staff.  
 (b) Long-run average of the REC data.  
 (c) REC data for permanent placements.

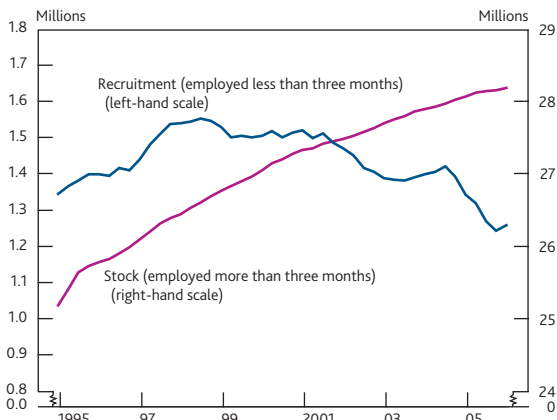
One could argue that the first three episodes were different because the oil price hikes were the result of disruptions in oil supply, whereas in episode IV and the current episode the oil price hike is more likely to be related to increased global demand. In that case, the observed rise in unemployment might remain modest going forward, or even fall, as it did during episode IV. But of course, there is always a risk that episode IV is the outlier; alerting us to the possibility that unemployment might rise more sharply should the demand for labour fall.

Consistent with muted labour demand, recruitment difficulties reported by contacts of the Bank's Agents were down ahead of my August decision, while the Recruitment and Employment Confederation survey data (REC) showed that the demand for permanent staff was around its long-run average (**Chart 6**). The recruitment rate — defined as the proportion of individuals with tenure of less than three months — continued its steady decline (**Chart 7**). The survey measures of employers' future employment intentions, reported by the Agents and the British Chambers of Commerce (BCC) had recently fallen (**Chart 8**). The number of vacancies had also risen.

The story was a little different at a disaggregated level. KPMG data suggested that staff availability was more of a limiting factor to recruitment in the financial and professional service industries.<sup>(2)</sup> This fitted with what the Bank's Agents were being told about employment intentions in the Financial and Business services sectors. So it seemed that different sectors of the economy were probably experiencing different conditions at the time. But in my view, in aggregate, there seemed a high likelihood that unemployment had increased in part as a result of more muted labour demand.

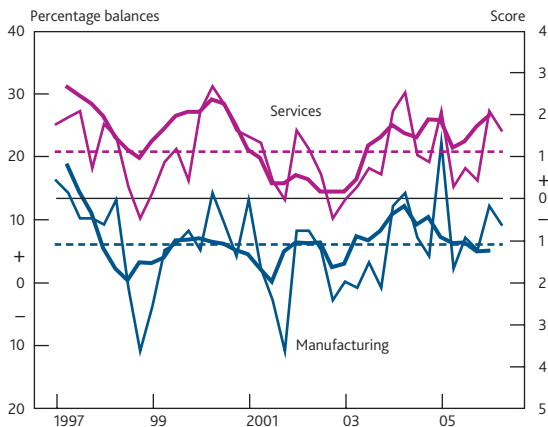
(1) See Walton, D (2006), 'Has oil lost the capacity to shock?', *Bank of England Quarterly Bulletin*, Spring, pages 105–14. For the United States, see Carruth, A A, Hooker, M A and Oswald, A J (1998), 'Unemployment equilibria and input prices: theory and evidence from the United States', *Review of Economics and Statistics*, Vol. 80(4), pages 621–28.  
 (2) REC/KPMG LLP (2006) *Report on Jobs*, August.

**Chart 7 Recruitment rate**



Source: Department for Work and Pensions.

**Chart 8 Employment intentions<sup>(a)</sup>**

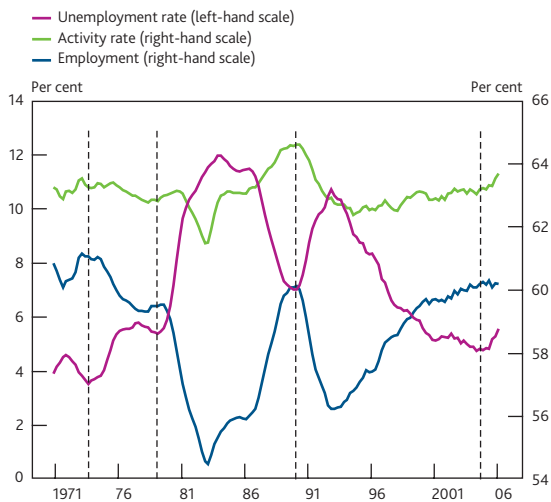


Sources: Bank of England and British Chambers of Commerce.

(a) Bold lines are Bank Agents' scores for employers' employment intentions over the most recent three months compared to a year earlier. These data have been lagged one quarter to make consistent with BCC data. Narrow lines are BCC survey data on employment intentions over the next three months. Dashed lines are long-run averages of the BCC data.

However, part of the explanation for the rise in unemployment is also that labour supply has increased, especially among older age groups, perhaps in part because of declining incomes from defined contribution plans.<sup>(1)</sup> Economic theory tells us that the expected wage of workers is higher during booms than in recessions, encouraging a larger fraction of the workforce to participate during a boom.<sup>(2)</sup> For this reason one would normally expect an increase in the unemployment rate to be followed by a fall in the participation rate. But recently there has been a continued rise both in participation and employment, in spite of the rise in unemployment. **Chart 9** shows the unemployment, employment and participation rates for the United Kingdom since 1971 and how the three rates have evolved over the economic cycle, and importantly for the current conjuncture, how they have moved following the most recent rise in unemployment. To aid this, marked on the chart are vertical lines showing the past troughs in the unemployment rate. It shows that in the past, the employment and unemployment rates are mirror images of

**Chart 9 UK unemployment, employment and participation<sup>(a)</sup>**



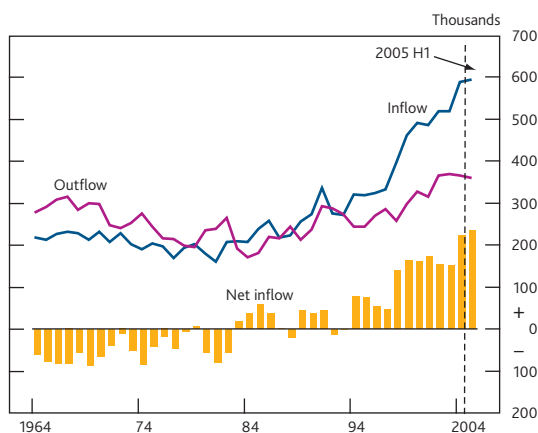
(a) The vertical dashed lines mark the trough in the unemployment rate. They have been identified as 1973 Q4, 1979 Q2, 1990 Q2 and 2005 Q1.

one another: following a rise in the unemployment rate the participation (activity) rate was flat in 1973, rising a little and then falling in 1979 and falling sharply in 1990. My assumption is that the participation and employment rates will start to turn down if unemployment continues to rise, as has happened in previous episodes.

The continued rise in participation at present may in part reflect increasing migration to the United Kingdom; an increase in labour supply (**Chart 10**). There has been a notable increase in the inflow of migrants since the accession of the A8 countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) on 1 May 2004.<sup>(3)</sup> Preliminary research shows that immigrants born in the A8 countries made up only around 0.6% of the stock of foreign-born individuals in the United Kingdom in 2005. But their share in terms of the immigrants who have arrived in the past two years is much bigger, now accounting for around one in four of new arrivals. This research also shows that, on average, immigrants who arrived in the United Kingdom in the past two years were somewhat less likely to be employed than the indigenous population. But within that group of immigrants there are differences. Those born in the A8 countries had higher employment rates compared to those born elsewhere. So, immigrants may have swelled the participation, employment and unemployment figures.

(1) The economic activity rate of those aged 16 and over increased from 63.0% in April-June 2004 to 63.6% in April-June 2006. The rates by age for the two years respectively were as follows: age 16-17 – 52.0% and 47.1%; age 18-24 – 74.7% and 74.5%; age 25-34 – 83.6% and 84.7%; age 35-49 – 84.7% and 85.3%; age 50-59 (women) – 68.4% and 70.2%; age 50-64 (men) – 74.5% and 75.1%; age 60+ (women) – 10.1% and 11.4%; age 65+ (men) – 8.8% and 10.0%. Source: First Release, *Labour Market Statistics*, August 2006, ONS, Table 12(1).  
 (2) See Clark, K B and Summers, L H (1982), 'Labor force participation: timing and persistence', *Review of Economic Studies*, Vol. 49, pages 825-44.  
 (3) I am grateful to Jumana Saleheen and Chris Shadforth for allowing me to draw on some of their work.

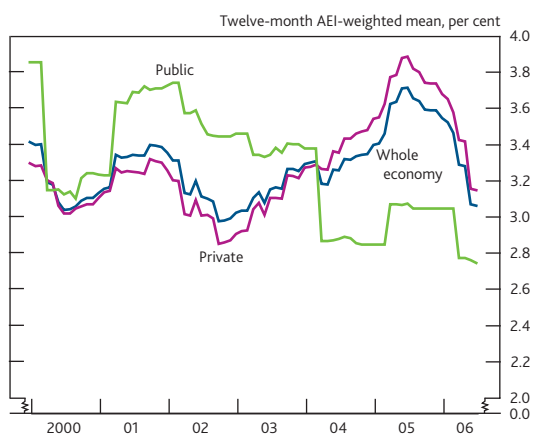
**Chart 10** International migration to and from the United Kingdom



Source: International Passenger Survey.

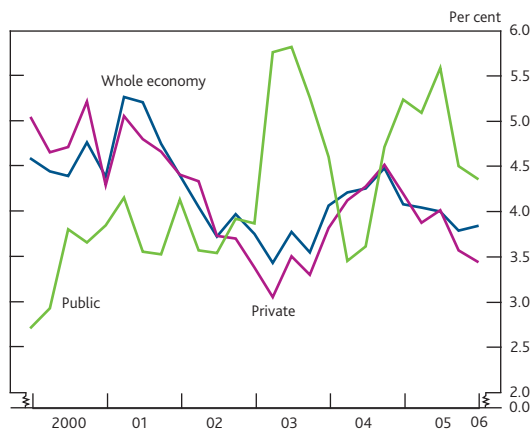
Pay pressures appear to have been constrained by the recent increases in labour supply, especially from increased immigration from Eastern Europe and rising participation of older workers and rising unemployment.<sup>(1)</sup> Whole-economy twelve-month average earnings index (AEI) weighted settlements had been easing continuously since July 2005 at the time of my August decision (Chart 11). And regular pay growth had been flat or slowing on most measures since late 2004 (Chart 12 and Table A). Moreover, the wage of new immigrants (including those from the A8 countries) has been strikingly weaker in the recent past (Chart 13), and some of this weakness is likely to have helped to moderate wage pressures in some sectors. The National Institute in their July *Economic Review* noted that employers are likely keeping down pay raises as many firms are contributing large amounts of money to their pension funds. These payments, the NIESR estimate, together with higher National Insurance contributions have increased from 13% of total labour costs in 2001 to around 17% in the first quarter of 2006.<sup>(2)</sup>

**Chart 11** Pay settlements



A particular problem with wage data based on sample surveys, such as the AEI, is that they exclude data from workers at the

**Chart 12** AEI regular pay growth<sup>(a)</sup>



(a) AEI excluding bonus payments.

**Table A** Annual regular pay growth

Percentage changes on a year earlier

	AEI <sup>(a)</sup>	AWE <sup>(b)</sup>	W&S <sup>(c)</sup>
<b>2004</b>			
Q1	4.0	3.3	3.5
Q2	4.2	3.5	4.0
Q3	4.2	3.7	2.9
Q4	4.5	3.8	3.6
<b>2005</b>			
Q1	4.1	4.3	4.1
Q2	4.0	4.2	3.3
Q3	4.0	4.4	3.4
Q4	3.8	4.1	3.5
<b>2006</b>			
Q1	3.8	4.1	3.7
Q2	3.9	4.0	n.a.

(a) Average earnings index, excluding bonus payments. Measures are three-month averages and exclude arrears.

(b) Experimental average weekly earnings, excluding bonus payments. Measures are based on quarterly data.

(c) National Accounts wages and salaries per employee.

low end of the wage distribution. For example, the ONS calculates the AEI using survey data from firms that employ more than 19 people. Hence, the wages of workers employed in smaller firms, which are frequently non-union, and have lower and more flexible wages than those of bigger, unionised workplaces, are excluded.<sup>(3)</sup> In addition, the 3.72 million self-employed are also excluded from the AEI wage series.<sup>(4)</sup>

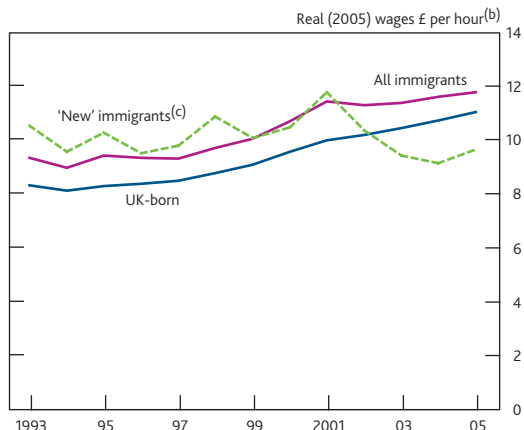
(1) The wage curve shows that the level of real wages is related to the level of unemployment — a doubling of unemployment reduces real wages by about 10%. See Blanchflower, D G and Oswald, A J (1994), *The wage curve*, MIT Press, Cambridge, Massachusetts; Blanchflower, D G and Oswald, A J (2005), 'The wage curve reloaded', *NBER Working Paper no. 11338*; and Bell, B, Nickell, S and Quintini, G (2002), 'Wage equations, wage curves and all that', *Labour Economics*, July, Vol. 9(3), pages 341–60.

(2) Barrell, B, Kirby, S and Riley, R (2006), 'UK economy forecast', *National Institute Economic Review*, No. 197.

(3) See Blanchflower, D G and Oswald, A J (1994) *op cit*; Blanchflower, D G and Oswald, A J (1994), 'Estimating a wage curve for Britain, 1973–1990', *Economic Journal*, September, pages 1,025–43; and Sanz-de-Galdeano, A and Turunen, J (2006), 'The euro-area wage curve', *Economics Letters*, Vol. 92, pages 93–98.

(4) Source: *Labour Market Statistics*, August 2006, ONS, Table 3.



Chart 13 Average hourly wage<sup>(a)</sup>

Sources: LFS and ONS.

(a) Based on employees aged 16–64 who report their wage. Those earning above £100 per hour or below £1 per hour are removed to avoid the analysis being influenced by such extreme observations.

(b) Real wages are based on 2005 prices as measured by the CPI.

(c) 'New' immigrants are defined as those who entered the United Kingdom in the survey year or the (calendar) year before the survey was carried out.

Their earnings are also likely to be flexible downwards in periods of rising unemployment and reduced work opportunities.<sup>(1)</sup> Based on current estimates from the Labour Force Survey these two sample exclusions account for some 29% of workers, or over 8 million workers. Hence, the AEI and other similar measures tend to *overestimate* wage growth in the economy when there is slack in the labour market.<sup>(2)</sup> This makes it more difficult to assess the current level of wage pressure. At present, I see no evidence of any second-round wage effects from the recent oil price increases.

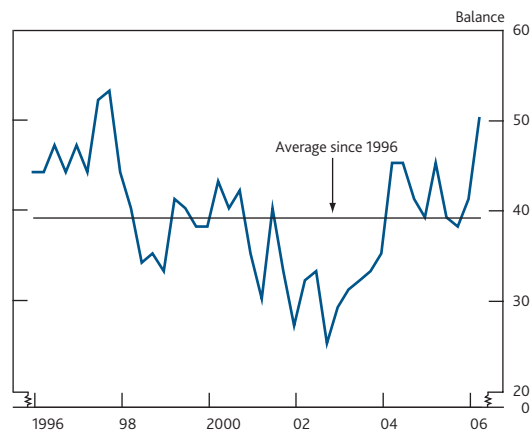
I also believe we will see a decline in the employment rate and further rise in unemployment going forward because of the current composition of employment growth. Of the 1.5 million new jobs created since 2000 Q1, 38.1% were public sector employees, 30.3% were self-employed workers with the remaining 31.6% of the new jobs among private sector employees. In 2006 Q1, out of 28.9 million workers, 13.0% were self-employed, 20.3% were public sector workers and 66.8% private sector employees.<sup>(3)</sup> This compares with 12.0% self-employed, 19.3% public sector employees and 68.7% private sector employees in 2000 Q1. It seems unlikely that there will be similar growth in employment in the future from the public sector or even from self-employment, which is cyclically rather volatile.<sup>(4)</sup>

In summary, at the time of my August decision the labour market appeared to be loosening, consistent with increases in labour supply and muted labour demand. This is clearly not consistent with the reduction in spare capacity implied by the ONS's upward revisions to the recent output data. As such, I now turn my attention to the alternative explanation, namely a *decrease* in spare capacity within firms. Is there any evidence of this having decreased? And more so, decreased enough to offset the looser labour market?

## Spare capacity within firms

There are a number of pieces of information that can shed light on how hard firms are working their factors of production, although in my opinion there was no consistent story in August. The CBI measure of spare capacity jumped well above its long-run average in 2006 Q2, suggesting some modest reduction in manufacturers' spare capacity (Chart 14). But the series is volatile, and I was unsure whether this increase was 'real' or simply volatility in the data. The BCC measures of spare capacity in the manufacturing and service sectors accorded with the CBI measure if the assumed long-run averages of the series are the appropriate gauges against which to compare the most recent outturns. However, the two measures are little changed from their post-1996 averages, my preferred metric (Chart 15). The Bank's Agents scores showed a little more disparity between the manufacturing and service sectors: manufacturers believed their degree of spare capacity had fallen, but remained below normal levels. Service sector firms continued to consider themselves as working beyond normal capacity (Chart 16). Both measures, however, had changed little since our July meeting. Overall I took the view that spare capacity within firms may have fallen slightly in aggregate, but not enough to more than offset the weaker labour market.

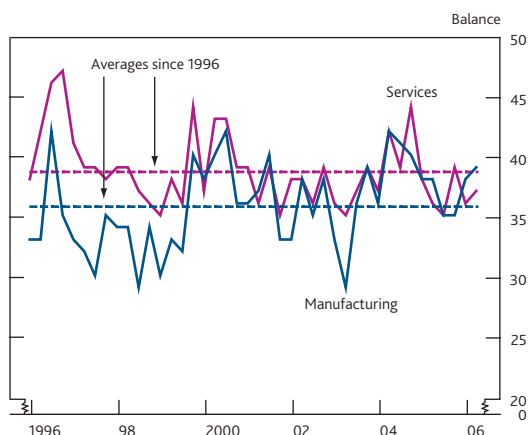
Chart 14 CBI measure of capacity utilisation



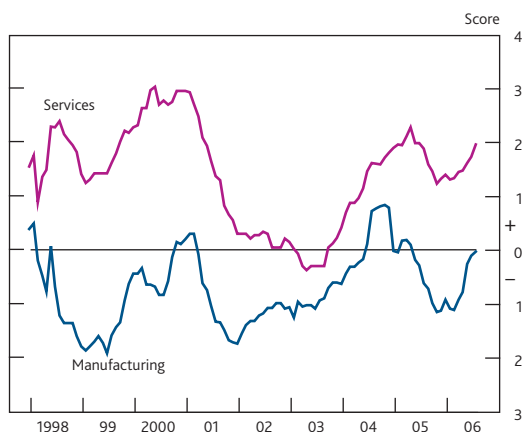
Source: CBI.

- (1) Weir found, using data from the *Family Resources Survey*, that, on average the earnings of the self-employed were higher than those of employees, but this was driven by earnings at the top end. Weir found that the first four fifths of self-employed people earned less than the first four fifths of employees but the highest one fifth earned more. Source: Weir, G (2003), *Labour Market Trends*, Vol. 111(9), pages 441–51.
- (2) Similarly, annual pay settlement data from large private sector firms or from the public sector tells us less about wage pressures in the economy than they did in the past when union bargaining coverage was more prevalent.
- (3) For more on the growth in public sector jobs see Hicks, S (2005), 'Trends in public sector employment', *Labour Market Trends*, Vol. 113(12), December.
- (4) For details on the determinants of self-employment see Blanchflower, D G (2004), 'Self-employment: more may not be better', *Swedish Economic Policy Review*, Vol. 11(2), Fall, pages 15–74 and Blanchflower, D G (2000), 'Self-employment in OECD countries', *Labour Economics*, Vol. 7, September, pages 471–505. For analysis of the growth in self-employment in the United Kingdom in recent years see Lindsay, C and Macauley, C (2004), 'Growth in self-employment in the UK', *Labour Market Trends*, Vol. 112(10), October, pages 399–404; Macauley, C (2003), 'Changes to self-employment in the UK: 2002 to 2003', *Labour Market Trends*, Vol. 111(12), December, pages 623–28; and Taylor, M P (2004), 'Self-employment in Britain: when, who and why?', *Swedish Economic Policy Review*, Vol. 11(2), pages 139–74.

Chart 15 BCC measure of capacity utilisation



Source: CBI.

Chart 16 Capacity constraints: agent scores<sup>(a)</sup>

(a) A score above zero indicates greater-than-normal constraints on capacity.

In my judgement the evidence in August suggested that the level of spare capacity was the same as, or even greater than, it was at our July meeting. There remained plenty of spare capacity in the economy — this was also the position Steve Nickell took earlier in the year when he too was in a minority of one and voted for interest rate reductions when the rest of the Committee voted for no change.<sup>(1)</sup> In my view there was insufficient empirical evidence of a lack of spare capacity, within or outside firms, although the majority of the Committee judged that the current margin of spare capacity in the economy as a whole was somewhat less than previously thought. I believe there to be more spare capacity in the economy than in the central projection contained in the *August Inflation Report*, implying lower output growth and lower inflationary risks down the road and a somewhat lower probability of having to write a letter to the Chancellor.

In my view, the labour market has continued to loosen since the August meeting. According to the ONS, the ILO unemployment rate rose to a six-year high of 5.5% in Q2, up

0.3 percentage points on the previous quarter, while the employment rate remained broadly unchanged for a tenth consecutive quarter.<sup>(2)</sup> There was evidence of a slight pickup in earnings growth, but that was largely driven by increased bonus payments in private sector services. Regular pay growth was broadly unchanged in 2006 Q2; AWE regular pay growth has been close to 4.0% over the first half of 2006, marginally stronger than AEI regular pay growth over the same period (Table A). Gross hourly earnings estimates from the LFS are down to 3.3% on an annual basis in 2006 Q2, although these estimates tend to be somewhat volatile.

There has been little news on the degree of spare capacity within firms since my August decision. The only data that have subsequently become available are the Bank's Agents scores for August. These show a further pickup in the extent to which service sector firms are working above normal capacity, although this figure remains below the most recent high of May 2005. Capacity utilisation within manufacturing firms continues to be (marginally) below normal.

Of course the questions surrounding the degree of spare capacity in the economy were not the only ones that were discussed during the round. The other main piece of news was on consumer prices. Importantly, CPI inflation rose to 2.5% in June (it subsequently fell back, but returned to 2.5% in August), its highest level since September 2005. That rise partly reflected the pass-through of previously announced increases in domestic energy prices into household bills. Looking ahead, higher university tuition fees and the continuing pass-through of higher energy prices are likely to push inflation further above the 2% target for a while. I saw little evidence of any pickup in domestically generated inflation in August.

## Prospects for inflation

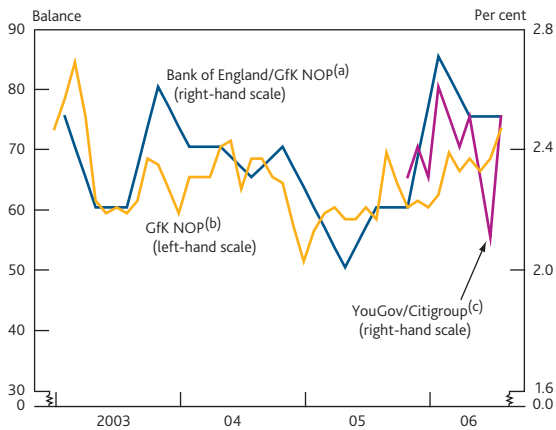
If inflation persists above the 2% target for too long the worry is that agents will start to revise up their expectations for inflation going forward. This may lead workers to demand higher wage settlements to offset the expected fall in their real wage. Inflation expectations did rise early in 2006, perhaps reflecting the preannouncement of energy price rises, but subsequently inflationary expectations appear to have levelled off (Chart 17).

If the monetary framework is credible, inflation expectations are less likely to be dislodged in the event of a cost shock. It seems to me that monetary policy in the United Kingdom *does* have credibility and inflationary expectations are well anchored on the inflationary target. In such a case a rise in

(1) Nickell, S J (2006), 'Monetary policy, demand and inflation', *Bank of England Quarterly Bulletin*, Spring, pages 95–104.

(2) The employment rate has been between 60.0% and 60.2% since 2004 Q1. Source: First Release, *Labour Market Statistics*, August 2006, ONS.

**Chart 17** Twelve-month ahead measures of households' inflation expectations



Sources: Bank of England, Citigroup, GfK NOP and YouGov.

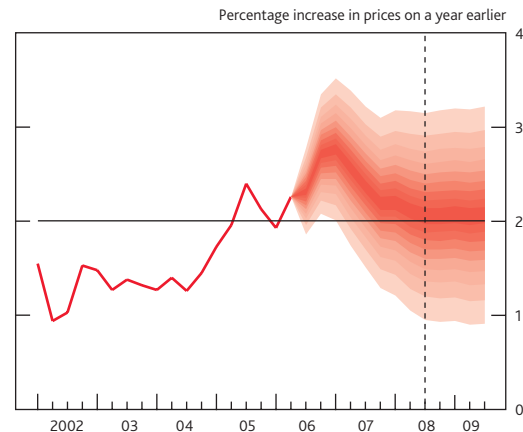
- (a) The survey takes place in February, May, August and November each year. The median responses are shown in the chart, calculated by assuming that responses are evenly distributed within bands. The observations for intervening months have been interpolated. The question asks: 'How much would you expect prices in the shops generally to change the next twelve months?'. In February, the survey is conducted in two waves. For the February 2006 survey, the first wave was conducted in February and the second in March.
- (b) Net balance expecting prices to increase. The question asks: 'In comparison with the past twelve months, how do you expect consumer prices will develop in the next twelve months?'
- (c) The question asks: 'How do you expect consumer prices of goods and services will develop in the next twelve months?'. The series is monthly and started in November 2005

consumer price inflation generated by some relative price increase such as a rise in oil prices is less likely to feed through into pay settlements because of the general belief that inflation will return to target. As Nickell (2006) noted: 'wage inflation has not responded significantly to the recent rise in oil prices so there have been no second-round effects and, consequently, the implications for monetary policy of the oil price increase are few'.

The Committee's projection for the probability of various outcomes for CPI inflation in the future is given by **Chart 18**, based on market interest rate expectations. If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best judgement is that inflation over the subsequent three years would lie within the darkest central band on only ten of those occasions.

The inflation profile is a little higher than in the *May Inflation Report*, particularly in the near term. As usual, there are risks surrounding the central projection. In addition to those that I have already discussed, namely the outlook for energy prices and their interaction with domestic pricing pressures, and the margin of spare capacity within firms and in the labour market, prospects for world growth and the strength and duration of the recovery in consumer spending are also important considerations.

**Chart 18** August 2006 CPI inflation projection based on market interest rate expectations



Source: Bank of England, August 2006 *Inflation Report*.

The world economy looks particularly uncertain going forward. The most recent FOMC decision (20 September) yielded a continuation of the pause in policy tightening first abated at their August meeting. According to the FOMC's minutes, the August decision, like ours, had been a close call, although the United States faces a different set of challenges to the United Kingdom. Core and headline inflation have been high for some time and housing market activity has come off the boil much quicker than some commentators had expected. Both channels could imply weaker consumer demand ahead, with repercussions for UK exporters. In contrast, household spending in the euro area has continued to recover in recent quarters, underpinned by a strengthening labour market. And Japanese growth appears to remain robust.

At home, consumption looks to have recovered, but there remain risks. Looking ahead, I will be watching out for signs of building demand pressures. But should the labour market continue to weaken, as I suspect, then we might expect to see a slowdown in household's income growth. Real incomes may also continue to be squeezed by higher energy prices, although we must also be cautious of potential second-round effects. In my opinion, the risks of a slowdown outweigh the chance that there may be more near-term momentum in spending growth. Overall, we are as a Committee unanimous in agreement that there is greater-than-usual uncertainty over the outlook for inflation, particularly in the near term. However, we will, as always, continue to take our decisions on the basis of the data that are available at the time of each decision.

# Prudential regulation, risk management and systemic stability

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In this speech,<sup>(1)</sup> Alastair Clark, Adviser to the Governor of the Bank of England, discusses Basel II capital requirements and the cyclical nature of credit conditions, the role of bank capital requirements in the face of greatly increased credit risk transfer and the importance of liquidity alongside capital as a factor in banks' overall financial position. He concludes that, although there are theoretical reasons for thinking that procyclicality might increase, it is too early to say how significant this effect will be in practice, that bank capital requirements against credit risk remain important given that banks are still a major, and often the dominant, channel for the provision of credit and that more intensive analysis is needed on whether, and if so in what form, it might make sense to establish international standards for liquidity, paralleling those for capital.

## Introduction

It is now nearly 20 years since the first Basel Accord on bank capital standards was agreed. During those 20 years the financial scene has changed dramatically: the volume and value of transactions have increased many times; the speed with which transactions are initiated and completed has accelerated; new markets have opened up, not least in the country hosting this conference; there has been an enormous expansion in the range of financial instruments available; financial firms have grown bigger and bigger, and international business has become increasingly concentrated in the hands of a relatively small number of 'mega' firms with balance sheets approaching, and in some cases exceeding, a trillion dollars.

The influences driving these developments are well known. First, the world economy has itself grown substantially over the same period, by a factor of something like three and a half in money terms — and financial activity typically increases faster than GDP. Second, there has been significant liberalisation in financial markets and in the environment for international capital flows. Third, technology has advanced enormously in terms of both the capacity of hardware and the sophistication of software.

One great benefit from all this activity has been a dramatic widening of the choices available to savers and investors, borrowers and lenders, and greater flexibility and efficiency in the allocation of capital. But it has at the same time made the world more complicated, with ever-closer interconnections within and between individual firms and markets. This in turn poses some serious challenges for firms themselves, in running their businesses and identifying and managing the risks they face, and for the financial authorities, who are responsible for

maintaining the overall stability of the system and trying to ensure that financial markets and financial firms operate prudently and fairly.

## Financial stability

Many factors contribute to the stability or otherwise of the financial system. Perhaps the most important is stability in the macroeconomic environment. History shows that episodes of financial instability have often originated in poorly judged macroeconomic policies or failure to respond appropriately to external macroeconomic shocks. But financial stability also depends on having a robust structural framework within which to carry out financial business. That means, for example, a reliable legal environment which ensures that contracts are clear and enforceable, an effective regulatory regime which is not unnecessarily burdensome but ensures that the public interest in the behaviour of financial firms is properly taken into account, an infrastructure which ensures that transactions once entered into are completed in a reliable and timely way, and an approach to disclosure which provides accurate information promptly to all interested parties.

This is a very broad territory and in my brief comments this morning I am going to focus on just one part of it — prudential regulation and risk management — and on three particular questions. These questions have one thing in common — they are all concerned with the way behaviour at the level of the individual firm can influence the behaviour of the financial system as a whole. The questions are:

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(1) Given at the China International Banking Convention in Beijing on 20 October 2006. This speech is available on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech286.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech286.pdf).

- how far is the new Basel II regime likely to reinforce cyclical changes in credit conditions?;
- how significant is the shift in banking practice, from 'initiate-and-hold' to 'initiate-and-distribute', in terms of the overall management of credit risk?; and
- what about liquidity?

## Procyclicality

Almost any kind of regulatory capital regime has the potential to generate or reinforce cyclical effects in bank lending. As economic conditions deteriorate, the level of provisions and write-offs is likely to rise with a corresponding reduction in banks' capital base. If lending is capital-constrained, this may lead to a tightening of lending conditions. And conversely, when the economy is strong, loan losses decrease and banks' capital tends to rise, allowing a faster expansion of lending.

There are, however, a lot of 'ifs' in this argument, including most obviously the question of whether banks do in fact run their business with capital at or just above the regulatory minimum. In practice, certainly in countries where the banking sector is subject to strong market discipline, they do not. For the most part, they aim to maintain levels of capital significantly above, and in some cases very significantly above, what the letter of the regulatory rules requires.

Basel II, however, introduces a further effect which at least in principle might act to increase cyclical swings in behaviour. Under Basel I, risk weights were assigned on an essentially static basis depending mainly on a sectoral classification of individual loans. Under Basel II, in contrast, not only does the capital of a bank tend to fluctuate with the economic cycle — higher in good times, lower in bad — but the measure of risk-weighted assets also fluctuates, typically declining when the economy is strong and increasing when it is weak. These two effects reinforce each other and, taken together, clearly have the potential to generate more pronounced cyclical swings in credit conditions.

This feature of Basel II was recognised during negotiations on the new Accord, but the extent of its potential impact was perhaps not fully taken on board until relatively late on. This is not the occasion to get into the details of 'through-the-cycle' versus 'point-in-time' loan ratings, although initially at least the designers of Basel II were probably thinking more in terms of the former, 'through-the-cycle', approach. Faced, however, with the banks' own practice, which varies but is often focused on relatively short-term projections of credit risk, the approach to loan ratings which has in the end been followed is closer to the 'point-in-time' version, with the corresponding potential for larger cyclical fluctuations.

The key question, however, is whether all this analysis of what might happen in theory is likely to hold good in practice. Many studies have been carried out aimed at providing an answer without, I think it is fair to say, arriving at any definitive conclusion. Some of these studies suggest that regulatory capital requirements could fluctuate overall by as much as 40% between peaks and troughs of the cycle, and by considerably more than that for some components of banks' loan portfolios. At the same time, the relatively benign and stable economic conditions which have been sustained in many economies over the past decade or more have led to figures for regulatory capital under Basel II which are sometimes significantly below those indicated by the existing Basel I regime. The numbers in the new Accord remain however to be reviewed, at least at the level of detail, in the light of experience.

But regulatory requirements are not necessarily the factor bearing most directly on the capital which banks, especially major international banks, seek to maintain. Participation in certain markets — for example swaps and repo — in practice requires capital to be well above the regulatory minimum and is heavily dependent on a bank's credit rating. The impact of Basel II will therefore depend importantly on how market counterparties, rating agencies, investment analysts and commentators interpret the new numbers. How far will they distinguish between structural and cyclical factors? How much of a buffer 'on average' might banks be expected to hold? These uncertainties are increased further by the recent introduction of new international accounting standards which can have a material effect on traditional financial measures.

In some countries, though, market discipline is not very strong and this puts more weight on supervisory oversight. Basel II makes provision for the exercise of supervisory discretion through its so-called 'Pillar II', which allows supervisors to encourage or require banks to build up buffers of capital in good times against the prospect that capital requirements may rise substantially if or when economic conditions deteriorate. This of course implies that buffers should be just that — in other words that they should not be regarded as a permanent part of the capital requirement but should be allowed to move up and down as conditions change. To put this into practice, however, means taking a view on the cyclical environment which firms face, not just in their home territory but, for international firms, across the whole of their business. This is a judgement which, for a variety of reasons of both principle and practice, financial and specifically supervisory authorities may find it difficult to make.

On the basis that regulatory capital requirements *can* have some cyclical impact, there remains an important question about what, if any, policy response is indicated. The fact that the effect arises from regulatory rules does not in itself imply that the appropriate response is through some modification of

those rules. Many factors contribute to cyclicity in the economy and a variety of instruments, including monetary policy, may be available to address them. But the effect of monetary policy may be constrained because, for example:

- While tighter monetary policy may rein back lending, looser monetary policy may not be so effective in stimulating lending. This is essentially because monetary policy has a more direct effect on liquidity conditions than on capital. There was some evidence of this asymmetry in the United States in the early 1990s and more recently in Japan.
- Use of monetary policy to try to stabilise credit conditions may not sit easily with monetary policy frameworks that have clearly prescribed alternative objectives, such as the pursuit of an inflation target. However, since a tightening of credit conditions is likely to lead to lower growth and inflation, often there will be no conflict between stabilising credit conditions and stabilising inflation.

Overall, this suggests that it would be premature to contemplate further policy action now to address cyclicity issues arising from Basel II but that, as experience with the new regime accumulates for firms but also for regulators, it is an issue which needs to be kept under review.

## Credit risk transfer and bank intermediation

The importance of Basel II from the point of view of its wider economic implications arises because banks typically remain the principal channel of financial intermediation and the principal source of credit for the economy as a whole. At the same time, recent years have seen extremely rapid growth in instruments and markets which allow the transfer of credit risk both within the banking sector and to investors outside the sector. Although reliable and comprehensive data on credit risk transfer is not available, recent surveys by, for example, the British Bankers' Association (BBA) and Fitch Ratings indicate just how rapid that growth has been. From almost nothing in the mid-1990s, the BBA estimate that the credit derivatives market had expanded to about \$1 trillion by 2000; and that the gross outstanding stock of credit derivatives of various kinds has now reached \$20 trillion. This compares with a figure for the overall credit exposures of the global banking sector of perhaps \$30–\$35 trillion.

At least on the face of it, these developments might prompt the question whether regulatory capital requirements against banks' credit exposures now really matter very much. After all, if banks are selling on a significant part of these exposures, how important from a wider economic perspective is the capital charge against what is left? I think this would, however, go too far.

- First, the figures I have quoted for credit derivatives are gross, whereas what matters more from the point of view of risk redistribution is the net position. The net figures are certainly much smaller.
- Second, despite stories about 'leakage', for example to hedge funds and insurance companies, much of the risk redistribution seems to be within the banking sector. To that extent, while the nature of the banks' assets may change, the character of the underlying exposures may not. This does however highlight the fact that conventional credit exposures on the loan book may increasingly be reappearing as market exposures in the trading book, and highlights the importance of the *Basel Trading Book Review*, which addresses *inter alia* credit exposures arising from trading activities.
- Third, some of the institutions which have been significant absorbers of credit exposure in the recent past may not be able or prepared to continue in that role if credit conditions change sharply; and furthermore many of these 'new' lenders may have neither the appetite nor the capacity to provide credit to some parts of the economy, notably small firms. For that reason too, the position of the banks is likely to remain of central importance.
- Finally, one of the key functions of banks is the assessment of credit risk based on a good knowledge of borrowers. For the largest companies, much of the relevant information may be in the public domain — especially if they are issuers of publicly traded bonds and have a credit rating — and therefore the comparative advantage of banks in making credit assessments may be limited. But for smaller borrowers this will usually not be the case and the detailed credit assessment capacity of the banks has a real role to play. From the point of view of public policy, the question of whether credit risk transfer could impair the overall capability for credit risk assessment — because the knowledge of borrowers available to the originator of loans may not be available to those who end up holding the credit risk — is one which merits further investigation.

In sum, therefore, and despite developments in credit risk transfer, bank lending and therefore bank regulatory capital standards seem certain to remain an important part of the picture for the foreseeable future. But monitoring developments in credit risk transfer — both the scale and to whom the credit risk is being transferred — will clearly also deserve close attention.

## Liquidity

The third and last of the topics I am going to touch on this morning is liquidity.

The term 'liquidity' is ambiguous and the concept is not an easy one to analyse. At the level of markets, it means the capacity to execute transactions without significant shifts in the price; at the level of firms, it means the capacity to acquire cash so as to meet obligations as they fall due. One striking thing about the recent international debate on prudential regulatory standards is that liquidity, in contrast to capital, has received relatively little attention. Certainly — and some may judge this no bad thing! — we are a long way from anything remotely corresponding to a Basel Accord for liquidity.

One of the main problems in analysing liquidity is that liquidity conditions are, to use the jargon, endogenous — that is, the liquidity conditions facing one market participant depend crucially on the behaviour of other market participants. And, to make matters more difficult still, market participants are likely to behave 'strategically' — that is, their behaviour will reflect guesses about what other market participants will do. This contrasts with the situation in relation to capital requirements against credit risk which depend much more on developments in exogenous conditions, such as fluctuations in economic activity.

In any event, the question of liquidity regulation was not addressed, except in a very general way, in Basel II. It would clearly be unwise, however, to conclude that liquidity is unimportant, either for the robustness of individual firms or the stability of the financial system as a whole. In the end, banks fail because they run out of cash; and while private money markets may now be much deeper than in the past, so that solvent banks should be able to access liquidity against good collateral, there are nevertheless sufficient uncertainties in this process, especially during times of stress, to make prudent liquidity management a top priority.

But as well as the broad prudential reasons for taking an interest in how banks go about their liquidity management, there are more specific reasons for a public policy interest. The ultimate source of liquidity in most economies is the central bank. Its operating procedures have a crucial impact on the environment for commercial banks' own liquidity management. The central bank is also typically the Lender of Last Resort. The existence of this backstop has the potential to induce moral hazard — meaning that banks may become less careful with their liquidity management, and their financial

management generally, than they would be if the backstop were not available. For that reason, some oversight of banks' behaviour in this area seems justified — but there is no broadly accepted model of how this should be carried out. Developing such a model would mean tackling not only the theoretical difficulties I referred to a moment ago but also a number of practical issues — for example, whether to focus on a consolidated group position or individual legal entities, whether to distinguish liquidity positions in different currencies, how to integrate liquidity held as a requirement for payment system membership with overall liquidity requirements, and how to combine limits on maturity mismatches with requirements on stocks of liquid assets.

This set of issues clearly has an important international dimension, especially in relation to so-called large complex financial institutions, which operate in many different countries. The issues concern not just what the 'rules of the game' should be in times of market stability but how liquidity pressures should be handled, and by whom, in times of crisis. The Basel Committee is beginning to engage in a limited discussion on liquidity, starting essentially with a mapping of current national practice. In addition, the European Commission has launched a study of liquidity-related issues as part of its effort to integrate further European financial markets. But these represent only very early steps. The question of whether there would be merit in some international understanding on liquidity management, and if so what form that might take, is still to be resolved.

## Concluding remarks

As I emphasised at the beginning of these remarks, risk identification, risk measurement and risk management have become increasing challenges in an ever more complex and interconnected global financial system. The three issues I have picked out are just a few of those which practitioners and the authorities face. All of them seem to me important and on each there is still much to do. I hope my remarks this morning have indicated why we think they are important — and, given the speed with which financial innovation spreads, important not just for the United Kingdom or international markets but important also for fast-developing markets in emerging economies.

# Globalisation and inflation

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In this speech,<sup>(1)</sup> Charlie Bean, Executive Director, Chief Economist and member of the Monetary Policy Committee, discusses the impact of globalisation on the industrialised countries and in particular the inflation process. He explains how globalisation has affected the returns to labour and capital, and the location of production in the world economy. Globalisation has also influenced relative prices, lowering the prices of imported goods but boosting the prices of oil and other commodities. And it may have changed the inflationary process, flattening the trade-off between domestic activity and inflation through a number of channels. Although globalisation has provided a benign backdrop for monetary policy, it poses a number of challenges going forward: the beneficial tailwind has waned and changes in product and labour markets have altered the determination of prices and wages in ways central bankers do not yet fully understand.

Good evening! Googling 'Globalisation' generates no fewer than 45 million hits,<sup>(2)</sup> so a lot of (virtual) ink has already been spilt on my topic tonight — though apparently rather less than on 'Madonna', given the 90 million hits that her name brings up. But the term is often used rather loosely — and sometimes abusively — to describe all sorts of phenomena. So my talk will focus on just the impact of globalisation on the industrialised economies — and in particular on the inflation process — of the changes in economic geography brought about by the integration of China, India and the emerging economies of Eastern Europe into the world economy and the increased ease with which production can be relocated around the globe.

Of course, the progressive development and integration of more countries into the international trading system is not a new phenomenon. In the post-war era, we have seen first the rise of Japan, followed closely by the emergence of Korea and the other tiger economies of South-East Asia. But what is new this time is the sheer scale of events, with the entry of China, India and Eastern Europe into the global market economy effectively doubling that economy's labour supply, from roughly 1.5 billion to 3 billion.

Now most of these extra workers are relatively unskilled and brought little capital with them into the world economy, so the effect has been to lower the ratios of skilled labour and physical capital to unskilled labour. This should then drive down the wages of unskilled labour relative to skilled labour, as well as driving up the rate of profit on capital. And we should expect to see the production of goods and services that are intensive in the use of unskilled labour shifting to these

emerging economies, with production in the industrialised countries shifting towards goods and services that are more intensive in the use of skilled labour — let us call them knowledge-based industries. That is indeed pretty much what has been happening.

Moreover, the integration of China, India and Eastern Europe into the global economy has coincided with an information and communications revolution that, along with falling transport costs, has made it feasible to push the division of labour ever further. So it is not just the production of labour-intensive goods that has been shifting eastwards, but also the labour-intensive elements within production cycles. So a product might be designed in an industrialised country such as the United Kingdom, but assembled in a country such as China, in turn using parts manufactured in surrounding countries. The geographical origin of a product becomes debatable in these circumstances: 'Made in China' would often be more accurately rendered as 'Assembled in China'. Moreover, after-sales service might rely on a call-centre based in India to record problems and utilise domestic workers to undertake the repairs. This unbundling of the production process into its constituent tasks, and the reallocation of those tasks to places with a comparative advantage in undertaking them, has increased the scope for businesses in the industrialised world to organise production in the most cost-effective manner possible.

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(1) Given to the LSE Economics Society, London School of Economics on 24 October 2006. This speech can be found on the Bank's website at [www.bankofengland.co.uk/publications/speeches/2006/speech287.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech287.pdf).

(2) You need to search on both 'Globalisation' and 'Globalization'!



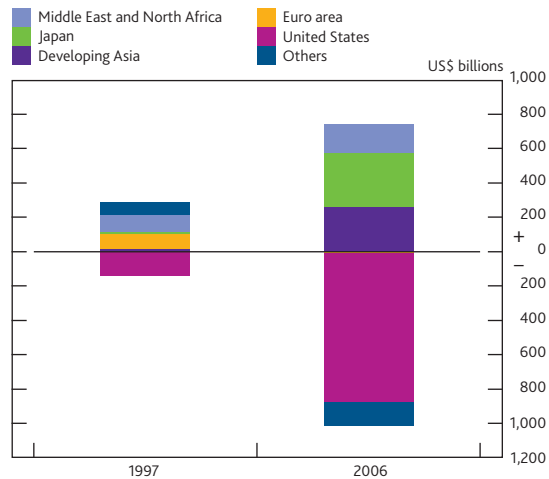
But this downward pressure on the wage of unskilled labour relative to that of skilled labour does not imply that unskilled labour in the industrialised economies is necessarily worse off. The resulting exploitation of the gains from trade means that the developed economies have access to some goods and services more cheaply than they can be produced at home — it is similar to discovering a new and more efficient technology. So the purchasing power of unskilled workers' wages may rise, even though their wages relative to those of skilled labour may have fallen. And it is even possible that the demand for unskilled labour in the domestic economy could actually rise. That could happen if some domestic unskilled labour is still necessary in production even after other tasks have been offshored, and if the decline in costs and fall in price stimulate a large enough increase in the demand for the product.<sup>(1)</sup> So evaluating the ultimate impact of globalisation on the living standards of unskilled workers in the industrialised economies is by no means straightforward. Labour Force Survey data suggest that, in the United Kingdom at least, any adverse effect on the living standards of unskilled workers has been nugatory at best, as average gross weekly earnings for elementary workers actually grew at a slightly faster rate between 1995 and 2006 than those for all workers, though that may reflect in part the impact of the National Minimum Wage.

Not everything has gone according to the economics textbook though. We would also have expected to see investment picking up in the emerging economies, with capital flowing from the industrialised countries, where it is abundant, to the emerging economies, where it is scarce. And if emerging-economy households are able to borrow against their higher expected future income, we might also expect to see consumption picking up. So we should be observing a current account deficit in the emerging economies and a surplus on their capital accounts. Investment certainly has picked up — in China it has touched an astonishing 45% of national output. But instead of running current account deficits, countries such as China have instead been running a surplus. Capital, far from flowing from the rich industrialised countries to the emerging economies, has tended to flow the other way, in particular to the United States (Chart 1).

Why might this have happened? One explanation is that it reflects a deliberate policy choice. The Asia crisis of 1997–98 revealed that developing countries relying on footloose foreign capital to finance investment were vulnerable to sudden stops or reversals in those capital flows. That has made emerging economies more inclined to rely on domestic savings to finance their investment. In China's case, this has partly been through substantial saving by the official sector, and in particular by the accumulation of foreign reserves, particularly US Treasuries, that are approaching \$1 trillion. Moreover, corporate saving has been unusually high in China, while the absence of a significant social safety net has also encouraged

households to maintain high rates of savings in order to build up a store of wealth for precautionary purposes.

Chart 1 Current accounts



Source: IMF.

A second explanation is that the capital markets in these countries are relatively underdeveloped, and the institutions for intermediating funds from savers to investors are relatively inefficient. That means that they may be relatively less effective at utilising capital inflows, other than through foreign direct investment, ie when foreign companies invest directly in subsidiaries domiciled in the emerging economy or via joint ventures. By contrast, the US financial markets are deep and liquid and still offer an attractive home for overseas investors.<sup>(2)</sup>

One other macroeconomic oddity that is also worth noting is the behaviour of global real interest rates. Standard economic analysis would suggest that the increased demand for investment goods resulting from the increase in global labour supply ought to drive up the world real interest rate. But world real interest rates have tended to fall over the past few years (see Chart 2; I focus on longer-term rates in order to abstract from short-term movements associated with the business cycle). That is something that former Fed Chairman, Alan Greenspan, described as a 'conundrum'. The current Fed Chairman, Ben Bernanke, has attributed it to an unusually high level of global savings<sup>(3)</sup> — a 'savings glut' — not just because much of the investment in the emerging economies has been financed by domestic savings, but also because of high rates of savings in Japan and the European Union driven by the ageing

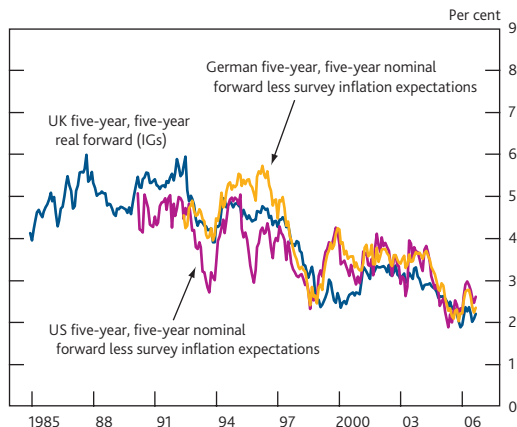
(1) For further analysis of trade in tasks and its effects, see Grossman, G and Rossi-Hansberg, E (2006), 'The rise of offshoring: it's not wine for cloth anymore', *Federal Reserve Bank of Kansas City Symposium*, Jackson Hole.

(2) See Prasad, E, Rajan, R and Subramanian, A (2006), 'Patterns of international capital flows and their implications for economic development', *Federal Reserve Bank of Kansas City Symposium*, Jackson Hole; and Caballero, R, Farhi, E and Gourinchas, P O (2006), 'An equilibrium model of global imbalances and low interest rates', *Centre for Economic Policy Research Discussion Paper no. 5573*, April.

(3) See Bernanke, B (2005), 'The global saving glut and the US current account deficit', Sandridge Lecture, *Virginia Association of Economics*, Richmond, Virginia.

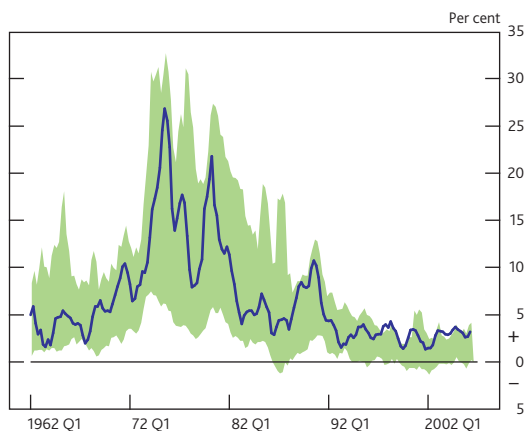
of their workforces. It is also possible that the rapid growth in global liquidity during the early years of the millennium may have played a part.

**Chart 2** Long-term real interest rates



Let me now turn to the aspect of globalisation that is of particular concern to central bankers, namely its impact on inflation. The past fifteen years have seen inflation rates settle at low levels throughout the industrialised world (**Chart 3**). And many countries in the developing world, which had previously experienced high inflation, have seen it falling. If you ask the average businessman or woman why this is the case, he or she is almost certain to reply that it is down to cheap imports from the Far East and Eastern Europe. Monetary policy probably won't get a mention. Yet you will all know from your first-year macroeconomics course that this can't be right, as inflation must ultimately be a monetary phenomenon. So how can we reconcile the business view with that of the economist?

**Chart 3** Inflation in industrialised countries



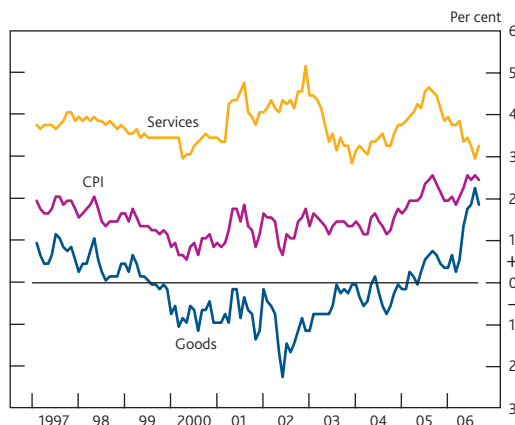
Source: Thomson Financial Datastream.

The answer, of course, is that globalisation essentially represents a shock to relative prices, not the absolute price level. Imports are only one part of the consumption basket,

and what happens to the general price level also depends on what happens to the prices of domestically produced goods and services. The prices of tradable goods that are close substitutes for the imports may be driven down, but the prices of other goods and especially non-tradable services can rise faster. This may happen automatically, if consumers react to the rise in purchasing power associated with cheaper imports to increase their spending on other goods and services, driving up their prices. But even if it doesn't, the overall inflation rate should in the long run remain unchanged, provided that the monetary authorities ensure that steady growth in overall nominal demand is maintained through an appropriate monetary policy. If a country does not fix its exchange rate and is free to pursue an independent monetary policy, it can ultimately always choose its own inflation rate.

That is graphically illustrated in **Chart 4**, which shows the inflation rates of goods and services separately. For much of the past decade, goods price inflation was depressed by the increased availability of cheap imports, especially from Asia. But that was offset to a degree by relatively rapid inflation in the less internationally tradable services category. Note, however, the recent pickup in the rate of inflation in goods prices as the effect of the increase in energy prices since 2004 and buoyant global demand works through, together with the corresponding decline in services inflation.

**Chart 4** Goods and services inflation



But this does not mean that globalisation has been irrelevant for the inflation process in the industrialised economies. Recall first that the standard view suggests that inflation is related both to the level of demand relative to potential supply — the output gap — and to expected inflation. Activity can only run ahead of potential supply in the economy so long as inflation runs ahead of expectations. Any attempt systematically to exploit this short-run trade-off is ultimately doomed to failure as inflation expectations will eventually adjust. That is an insight that won Ned Phelps this year's Nobel Prize for economics. But globalisation affects this story in a number of ways.

First of all, movements in the terms of trade — the price of exports relative to that of imports — associated with globalisation potentially alters the level of activity that is consistent with stable inflation. Thus the availability of cheap imports from Asia has acted very much like a positive supply shock, boosting potential supply. That is because UK businesses' demand for labour depends inversely on the cost of that labour relative to the price of their output, while workers' supply of labour depends on the purchasing power of their earnings, some of which is spent on imported goods. So a fall in the price of imports relative to domestic goods allows workers to enjoy higher real wages without any cost to their employers. This then tends to raise the equilibrium level of employment in the economy.

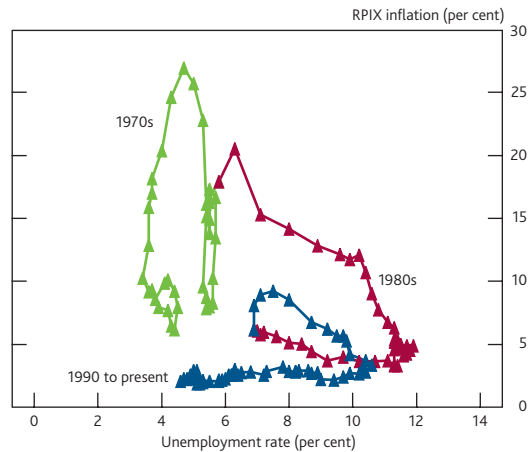
In effect then, the beneficial terms of trade shock provides a favourable 'tailwind', allowing central banks to run the economy at a higher level of activity than would otherwise have been the case, or else to bring inflation down without having to squeeze down on growth. But empirical studies — many of them carried out at the Centre for Economic Performance here at LSE — suggest that this effect may only be temporary, possibly because workers start building into their wage aspirations the extra increase in living standards from the terms of trade gain. That suggests we should not count on it continuing.

Moreover, the development of China and India has been something of a double-edged sword, as rapid Asian growth has been a major driver of the tripling of oil prices since early 2004, as well as pushing up the prices of non-oil commodities substantially. Countries importing these commodities have therefore suffered an increase in the price of these imports that offsets to some degree the gain from access to low-cost goods. Even for a country like the United Kingdom, which is roughly self-sufficient in oil, the rise in the oil price will still initially redistribute income away from households and non-oil businesses and towards the oil companies and the government. Should workers resist the consequent decline in the purchasing power of their wages, the level of potential supply would be adversely affected.

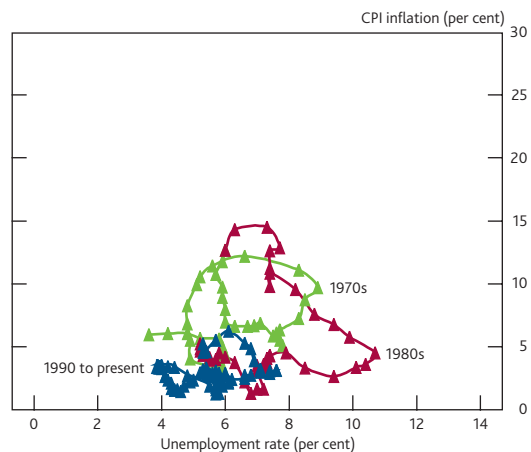
The second potential effect of globalisation is on the short-run dynamics of the inflation process. One of the most notable developments of the past decade or so has been the apparent flattening of the short-run trade-off between inflation and activity. That is particularly obvious in the case of the United Kingdom (**Chart 5**), but can also be observed in many other countries (eg **Chart 6** for the United States). As can be seen, the 1970s were characterised by an almost vertical relationship in the United Kingdom, in which any attempt to hold unemployment below its natural rate resulted in rising inflation. In the 1980s, the downward-sloping relationship reappears, as inflation was squeezed out of the system by the

slack in the economy. However, since the early 1990s, the relationship looks to have been rather flat.

**Chart 5** UK Phillips curve



**Chart 6** US Phillips curve



Source: Thomson Financial Datastream.

Now in theory, it is possible that this just reflects our extraordinarily precise management of aggregate demand, which has kept unemployment exactly in line with a falling natural rate. But while macroeconomic policy may have been much better over this period, it defies belief that it was *that* much better. Instead it looks as if the inflation process itself may have changed in some way.

Part of the story probably is connected to the change in policy regime, though in a more subtle fashion. Inflation targeting appears to have kept inflation expectations well-anchored (**Chart 7**), whereas in the past falling unemployment might have led to expectations of higher future inflation, adding to the upward pressures on current inflation. Moreover, businesses need to raise prices less frequently to keep up with inflation when its average rate is low, so that increases in demand are less likely to lead to an increase in the overall price level, at least in the short run.

Chart 7 UK inflation expectations since 1995



But the structural consequences of globalisation also seem to have flattened the short-run trade-off between inflation and the domestic output gap through a variety of channels. First, the increased trade and specialisation associated with globalisation reduces the response of inflation to the domestic output gap, and at the same time potentially makes it more sensitive to the balance between demand and supply in the rest of the world.<sup>(1)</sup> A recent study carried out at the Bank for International Settlements by Claudio Borio and Andy Filardo<sup>(2)</sup> finds some empirical support for this proposition across a range of countries.

Second, increased competition from labour-abundant economies may reduce the cyclical sensitivity of profit margins, as businesses have less scope to raise their prices when domestic demand increases. So assuming that marginal costs rise with output, we would expect that the mark-up of price over marginal cost will tend to be squeezed more when demand rises (and *vice versa*, when it falls). Work carried out at the Bank by former MPC member, Steve Nickell, together with Nicoletta Batini and Brian Jackson<sup>(3)</sup> finds that this indeed seems to be the case.

Third, production costs may also have become less sensitive to the state of the business cycle. The increased ease with which activities can be off-shored to China, India or Eastern Europe will make workers less inclined to push for higher wages when unemployment falls, and stiffen the hand of employers in resisting such claims, so limiting the effect of higher activity on the marginal cost of labour.

Moreover, there is an additional factor in the case of the United Kingdom, in the shape of increased inward migration. Official migration estimates — though it should be emphasised that there is very considerable uncertainty over the true magnitude — together with a reasonable assumption about migrants' labour force participation suggests that migration probably accounts for around two thirds of the increase in the workforce since 1997. The size of this flow, particularly from the Accession countries of Eastern

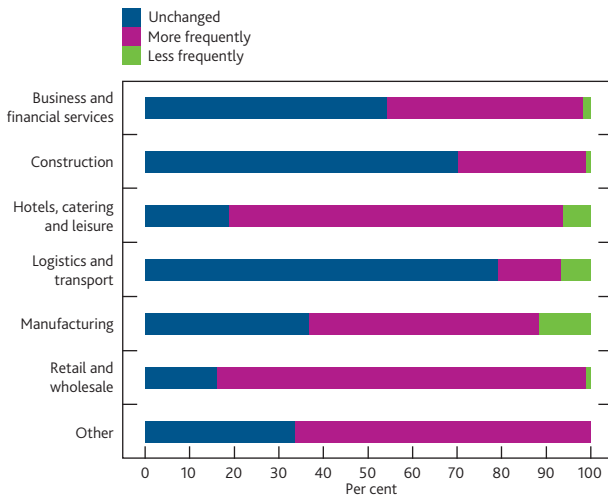
Europe, reflects in part the substantial wage differentials between the United Kingdom and the migrants' home country, but the magnitude of the flow is also likely to vary in line with the tightness of the UK labour market. And businesses are increasingly used to sourcing their workers from abroad, often through the use of specialised agencies. So if they are finding it difficult to get the additional workers they need, rather than bidding up wages to attract them from other firms, they may instead simply look to get them from abroad. The migration resulting from the increased international mobility of labour therefore represents another force that weakens the link between activity and the cost of labour.

These three factors — increased specialisation; the intensification of product market competition; and the impact of that intensified competition and migration on the behaviour of wages — should all work to flatten the short-run trade-off between inflation and domestic activity. But it is worth mentioning one consequence of globalisation that might work in the opposite direction. An increase in the competitive pressures in product markets will mean that the profits foregone by setting a price at the 'wrong' level will be all the greater. That would encourage businesses to revise their prices more frequently, and will tend to steepen, rather than flatten, the trade-off.<sup>(4)</sup> That is in the opposite direction from the likely impact of moving to an environment of low inflation that I mentioned earlier.

By way of providing some evidence on this, we recently asked our regional Agents to conduct a small survey of some of their business contacts in order to see how the frequency of price changes had changed over the past decade. **Chart 8** shows the results, broken down by sector.<sup>(5)</sup> There is a marked tendency towards an increased frequency of price changes in virtually all sectors, including in manufacturing which is probably the sector most exposed to the effects of globalisation. The increase in the frequency of price changes in retailing is particularly striking and probably reflects the dramatic intensification of competition in that sector — the 'Tesco effect' — as well as the consequences of technological advances that make the fine-tuning of prices easier.

- (1) See, for instance: Gali, J and Monacelli, T (2005), 'Monetary policy and exchange rate volatility in a small open economy', *Review of Economic Studies*, Vol. 72, pages 707–34; and Assaf, R and Yuen, C W (2002), 'The 'New Keynesian' Phillips curve: closed economy vs. open economy', *Economics Letters*, Vol. 75, May, pages 1–9.
- (2) Borio, C and Filardo, A (2006), 'Globalization and inflation: new cross-country evidence on the global determinants of domestic inflation', *mimeo*, Bank for International Settlements, Basle.
- (3) Batini, N, Jackson, B and Nickell, S (2005), 'An open economy New Keynesian Phillips curve for the UK', *Journal of Monetary Economics*, Vol. 52, pages 1,061–71.
- (4) See Rogoff, K (2003), 'Globalization and global disinflation', in Federal Reserve Bank of Kansas City, *Monetary policy and uncertainty: adapting to a changing economy*, pages 77–112.
- (5) The original version of this speech included a somewhat different version of this chart and contained a calculation error.

**Chart 8** Frequency of price changes



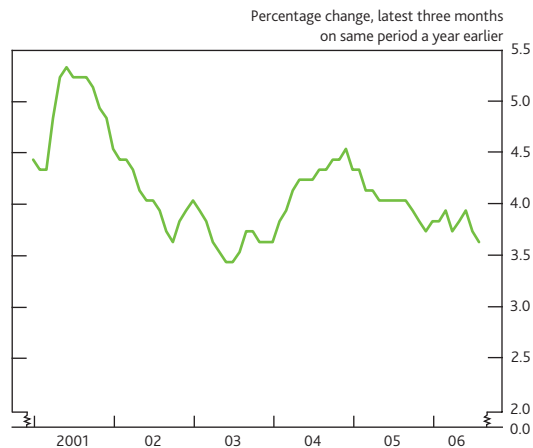
The extent to which the flattening of the short-run inflation-activity trade-off is down to globalisation, and the extent to which it is associated with the change in monetary regime is ultimately an empirical matter. There are cross-country empirical studies that suggest that it is indeed flatter in more open economies.<sup>(1)</sup> And there are also studies that suggest that the change in the conduct of monetary policy has been important.<sup>(2)</sup> So both factors are likely to be at work.

Perhaps even more important than the way globalisation has affected the response of inflation to demand is the way that it appears to have altered the response to cost shocks. If you had told the MPC in early 2004 that oil prices would triple over the following two years, I think we would have been very worried indeed about the possible inflationary impact, notwithstanding the fact that it was partly associated with the same globalisation forces that were helping to drive down the prices of imported goods. While the oil intensity of production today is about half what it was in the 1970s, we would nevertheless have been concerned that the higher cost of energy would lead to so-called second-round effects on wages as workers sought to maintain the purchasing power of their earnings, as well as on to the prices of other goods and services.

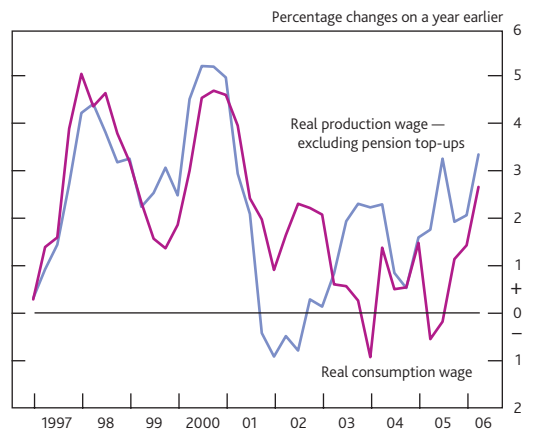
In the event, pay growth has so far remained remarkably stable (Chart 9). Indeed far from picking up over the past year or so, it has actually eased. Since consumer price inflation has picked up during that time, the rate of growth of the purchasing power of those wages (the real consumption wage in Chart 10) has slowed and ensured that the real wage in terms of the price of UK output (the real product wage) has grown more or less in line with trend productivity growth.

One reason why wage growth may have been so subdued is that unemployment has edged up since early 2005. But that appears not to be the whole story. Exactly the same

**Chart 9** Regular pay growth



**Chart 10** Real wages<sup>(a)</sup>



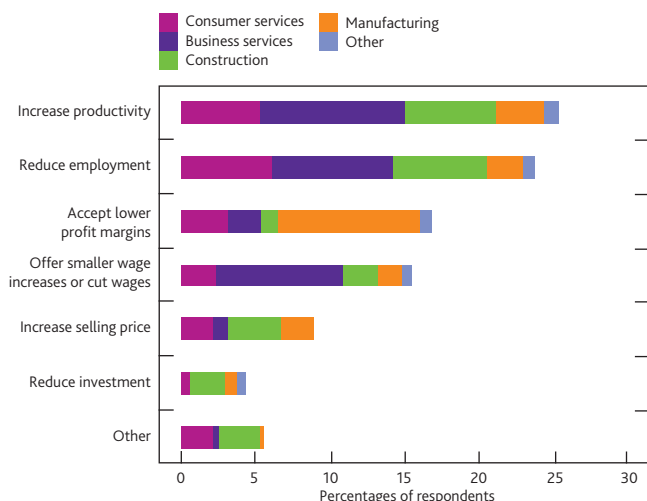
(a) Real consumption wage defined as household post-tax wages and salaries per head divided by the consumption deflator. Includes non-profit institutions serving households. Real product wage defined as total compensation of employees per head relative to the gross value added (GVA) deflator of the non-oil and gas private sector (Bank estimate, using ONS experimental data on the market sector).

heightened competitive pressures in product markets that appear to have contributed to the flattening of the inflation-activity trade-off, may also have affected the way that businesses have responded to the increase in energy costs. Rather than immediately pass on in full such increases in higher prices, it appears that they may have instead looked to lower other costs, either by granting lower wage increases, or by putting downward pressure on the prices of intermediate inputs, or by raising efficiency. Our regional Agents have also asked a sample of their business contacts how they have responded to the squeeze in profit margins occasioned by the rise in energy costs. The survey suggested that relatively few businesses expected to be able to raise prices and instead planned to raise efficiency, reduce employment or push down on wage and other costs (Chart 11). And some respondents felt they had little alternative but to accept the hit on their

(1) See Daniels, J, Nourzad, F and Vanhooose, D (2005), 'Openness, central bank independence, and the sacrifice ratio', *Journal of Money, Credit and Banking*, Vol. 37, April, pages 371-79.  
 (2) See Benati, L (2005), 'The inflation-targeting framework from an historical perspective', *Bank of England Quarterly Bulletin*, Summer, pages 160-68.

margins. That was especially the case in manufacturing, which is the sector that is most exposed to international competition.

**Chart 11** Response to lower profit margins



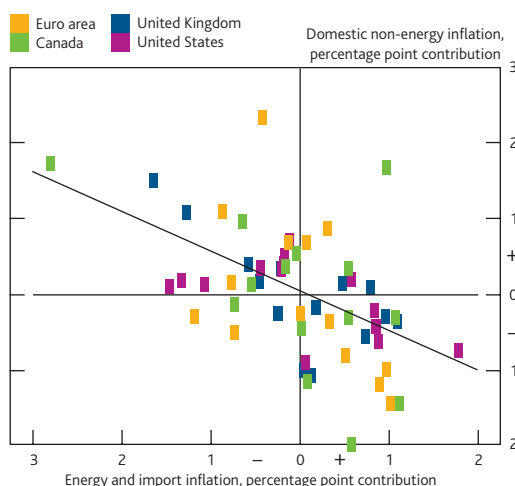
The consequence of this is that, far from seeing second-round effects on wages and other prices as energy costs have risen, if anything they so far seem to have acted as a bit of a cushion. That is illustrated in **Chart 12**, which shows the contribution to inflation of the domestic non-energy component of consumer prices for the United Kingdom, United States, the euro area and Canada since 1993 plotted against the contribution of energy and import prices, which can be treated as being largely exogenous to each region. (For clarity and to allow for different average overall inflation rates, the inflation components are presented as deviations from regional averages.) There are clear signs of an inverse correlation in all regions, though the relationship is certainly far from perfect. But if this relationship continues to hold in the future, then we might expect the beneficial effect on inflation from the recent fall in oil prices to be partly offset by faster inflation in the non-energy components of consumer price inflation as businesses seek to rebuild their profit margins and workers make up for the squeeze on the purchasing power of their wages.

(Some commentators have interpreted this as implying that a rise in oil prices is bad news and a fall in oil prices is also bad news. That, of course, is nonsense. The presence of a countervailing response of non-energy price inflation to changes in energy price inflation just means that a rise in oil prices is not such bad news for inflation as it first appears, and that a fall in oil prices is not such good news as it first appears.)

Finally, some brief words on how the changes in inflation dynamics that appear to be down in part to the impact of globalisation might affect the conduct of monetary policy. Clearly the reduced pass-through of energy cost increases into wages and prices is good news for central banks. But the

flattening of the inflation-activity trade-off is rather more of a mixed blessing. On the one hand, demand shocks and policy errors will not show up in large movements of inflation away from target. On the other hand, variations in aggregate demand become rather less effective as a means of controlling inflation. So if inflation has settled above target, a deeper or more prolonged slowdown is potentially required to bring it down. That puts an even greater premium on keeping inflation expectations well-anchored around the target. Given that we know relatively little about how people form their expectations, it suggests that it is better to err on the side of caution by preventing any sustained pickup (or decline) in inflation in the first place. And given that demand movements may contain little information about future inflation pressures, it suggests the need to pay particular attention to direct measures of incipient inflationary pressures in both product and labour markets.

**Chart 12** Domestic non-energy inflation versus energy and import inflation (contributions to CPI)<sup>(a)</sup>



Sources: Thomson Financial Datastream and Bank calculations.

(a) Contribution to annual CPI inflation, percentage point deviations from mean 1993–2006.

Let me conclude by noting that the integration of China and the other emerging economies represents both an opportunity and a challenge for the industrialised economies. It is an opportunity because it allows a more efficient international division of labour and has the potential to raise living standards in both East and West. And it is a challenge because the global relocation of activities potentially involves losers as well as gainers. The danger is then that the realisation of those potential gains is prevented by the imposition of protectionist measures. The challenge to policymakers is to make sure that does not happen.

Globalisation also offers a special challenge to monetary policymakers. While globalisation is not the ultimate cause of the generally low and stable inflation experienced by most industrialised economies over the past fifteen years, the

associated improvement in the industrialised countries' terms of trade has provided a benign backdrop to the widespread pursuit of low inflation through stability oriented monetary policies. But that beneficial tailwind has waned somewhat in the past couple of years. Moreover, intensified competition in product markets, along with other factors, does seem to have altered the way in which wages and prices are determined, complicating our task. Central bankers are a long way from having a full understanding of what is going on here and further research on these questions is definitely called for. Perhaps when I next give a speech here, some of you will have come up with the answers.





# Appendices



## Bank of England speeches

Speeches made by Bank personnel since publication of the previous *Bulletin* are listed below.

### [Risk to the commercial property market and financial stability](#)

Speech by Nigel Jenkinson, Executive Director, Financial Stability to the IPD/IPF Property Investment Conference, Brighton 30 November 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech293.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech293.pdf)

### [Perspective on current monetary policy](#)

Speech by Rachel Lomax to the Cardiff Business Club on 27 November 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech292.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech292.pdf)

### [Speech by Mervyn King, Governor](#)

(Reproduced on pages 432–33 of this *Bulletin*.)  
Speech at the Best of the Black Country Awards in Wolverhampton on 16 November 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech291.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech291.pdf)

### [Practical issues in preparing for cross-border financial crises](#)

(Reproduced on pages 452–55 of this *Bulletin*.)  
Speech by Sir John Gieve at the Financial Stability Forum Workshop: Planning and Communication for Financial Crises and Business Continuity Incidents on 13 November 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech290.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech290.pdf)

### [International monetary stability — can the IMF make a difference?](#)

(Reproduced on pages 434–41 of this *Bulletin*.)  
Lecture by Rachel Lomax at the GAM Gilbert de Botton Award Lecture on 1 November 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech289.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech289.pdf)

### [Trusting in money: from Kirkcaldy to the MPC The Adam Smith Lecture 2006](#)

(Reproduced on pages 425–31 of this *Bulletin*.)  
Speech by the Governor in Kirkcaldy, Scotland on 29 October 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech288.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech288.pdf)

### [Globalisation and inflation](#)

(Reproduced on pages 468–75 of this *Bulletin*.)  
Speech by Charles Bean to the LSE Economics Society, London School of Economics on 24 October 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech287.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech287.pdf)

### [Prudential regulation, risk management and systemic stability](#)

(Reproduced on pages 464–67 of this *Bulletin*.)  
Remarks by Alastair Clark at the China International Banking Convention in Beijing, China on 20 October 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech286.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech286.pdf)

### [Hedge funds and financial stability](#)

(Reproduced on pages 447–51 of this *Bulletin*.)  
Speech by Sir John Gieve at the HEDGE 2006 Conference on 17 October 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech285.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech285.pdf)

### [Speech by Mervyn King, Governor](#)

(Reproduced on pages 422–24 of this *Bulletin*.)  
at the Great Hall in Winchester on 10 October 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech284.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech284.pdf)

### [Reflections on my first four votes on the MPC](#)

(Reproduced on pages 456–63 of this *Bulletin*.)  
Speech by Professor David Blanchflower at a breakfast with contacts of the Bank's Agency for Wales on 27 September 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech283.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech283.pdf)

### [The puzzle of UK business investment](#)

(Reproduced on pages 442–46 of this *Bulletin*.)  
Speech by Sir John Gieve at the University of the West of England on 26 September 2006.

[www.bankofengland.co.uk/publications/speeches/2006/speech272.pdf](http://www.bankofengland.co.uk/publications/speeches/2006/speech272.pdf)

## Contents of recent Quarterly Bulletins

The articles and speeches that have been published recently in the *Quarterly Bulletin* are listed below. Articles from November 1998 onwards are available on the Bank's website at:

[www.bankofengland/publications/quarterlybulletin/index.htm](http://www.bankofengland/publications/quarterlybulletin/index.htm).

### Articles and speeches

*Speeches are indicated by (S)*

#### Spring 2004

- Durable spending, relative prices and consumption
- Asset pricing and the housing market
- The relationship between the overnight interbank unsecured loan market and the CHAPS Sterling system
- How much does bank capital matter?
- Measuring total factor productivity for the United Kingdom
- The Governor's speech at the annual Birmingham Forward/CBI business luncheon (S)
- Inflation targeting — achievement and challenges (S)
- Risk, uncertainty and monetary policy regimes (S)
- E-commerce and the foreign exchange market — have the promises been met? (S)

#### Summer 2004

- Assessing the stability of narrow money demand in the United Kingdom
- Deriving a market-based measure of interest rate expectations
- The economics of retail banking — an empirical analysis of the UK market for personal current accounts
- The financing of smaller quoted companies: a survey
- Recent developments in surveys of exchange rate forecasts
- Sterling money market funds
- The new Bank of England Quarterly Model
- Public attitudes to inflation
- Perfect partners or uncomfortable bedfellows? On the nature of the relationship between monetary policy and financial stability
- A review of the work of the London Foreign Exchange Joint Standing Committee in 2003
- Reform of the Bank of England's operations in the sterling money markets
- Puzzles in today's economy — the build-up of household debt (S)
- Speech at the National Association of Pension Funds Annual Investment Conference (S)
- Boring bankers — should we listen? (S)
- Speech at CBI Yorkshire and the Humber annual dinner (S)

#### Autumn 2004

- How should we think about consumer confidence?
- Household secured debt
- Housing equity and consumption: insights from the Survey of English Housing
- Why has world trade grown faster than world output?
- The institutions of monetary policy (S)
- The Governor's speech to the CBI Scotland dinner (S)
- The Governor's speech at the Mansion House (S)
- Keeping the party under control — anniversary comments on monetary policy (S)
- Some current issues in UK monetary policy (S)
- Managing the central bank's balance sheet: where monetary policy meets financial stability (S)
- Household debt, house prices and consumption growth (S)

#### Winter 2004

- British household indebtedness and financial stress: a household-level picture
- The new sterling ERI
- Using option prices to measure financial market views about balances of risk to future asset prices
- The foreign exchange and over-the-counter derivatives markets in the United Kingdom
- The external balance sheet of the United Kingdom: recent developments
- Stability and statistics (S)
- Why is inflation so low? (S)
- Monetary policy, data uncertainty and the supply side: living with the statistical fog (S)

#### Spring 2005

- Dealing with data uncertainty
- Indicators of short-term movements in business investment
- Divisia money
- Inside the MPC
- The role of central banks in payment systems oversight
- The Governor's speech to the CBI Dinner in Manchester (S)
- The Governor's speech on the International Monetary System (S)
- Why monetary stability matters to Merseyside (S)
- Monetary policy in an uncertain world (S)
- Why has inflation been so low since 1999? (S)
- The housing market and the wider economy (S)

#### Summer 2005

- The impact of government spending on demand pressure
- How important is housing market activity for durables spending?

- The inflation-targeting framework from an historical perspective
- Monetary policy news and market reaction to the *Inflation Report* and *MPC Minutes*
- Addendum to *Report on modelling and forecasting at the Bank of England*
- Public attitudes to inflation
- Chief Economist Workshop April 2005: exchange rate regimes and capital flows
- Implementing monetary policy: reforms to the Bank of England's operations in the money market
- A review of the work of the London Foreign Exchange Joint Standing Committee in 2004
- Monetary policy: practice ahead of theory  
The Mais Lecture 2005: speech by the Governor (S)
- Inflation targeting in practice: models, forecasts and hunches (S)
- Monetary policy, stability and structural change (S)
- How much spare capacity is there in the UK economy?
- Communicating monetary policy in practice (S)
- Monetary policy in the United Kingdom — the framework and current issues (S)
- A matter of no small interest: real short-term interest rates and inflation since the 1990s (S)

#### Autumn 2005

- Assessing the MPC's fan charts
- Long-run evidence on money growth and inflation
- The determination of UK corporate capital gearing
- Publication of narrow money data: the implications of money market reform
- The Governor's speech at Salts Mill, Bradford (S)
- The Governor's speech at the Mansion House (S)
- Monetary policy making: fact and fiction (S)

#### Winter 2005

- Introducing the Agents' scores
- Do financial markets react to Bank of England communication?
- Financial stability, monetary stability and public policy
- Share prices and the value of workers
- Stabilising short-term interest rates
- The Governor's speech to the CBI North East annual dinner (S)
- UK monetary policy: the international context (S)
- Economic stability and the business climate (S)
- Challenging times for monetary policy (S)
- Monetary policy challenges facing a new MPC member (S)

#### Spring 2006

- New information from inflation swaps and index-linked bonds
- The distribution of assets, income and liabilities across UK households: results from the 2005 NMG Research survey

- Understanding the term structure of swap spreads
- The information content of aggregate data on financial futures positions
- The forward market for oil
- The Governor's speech in Ashford, Kent (S)
- Reform of the International Monetary Fund (S)
- Global financial imbalances (S)
- Monetary policy, demand and inflation (S)
- Has oil lost the capacity to shock? (S)

#### Summer 2006

- House prices and consumer spending
- Investing in inventories
- Cost-benefit analysis of monetary and financial statistics
- Public attitudes to inflation
- The Centre for Central Banking Studies
- A review of the work of the London Foreign Exchange Joint Standing Committee in 2005
- Uncertainty, the implementation of monetary policy, and the management of risk (S)
- Reflections on operating inflation targeting (S)
- Cost pressures and the UK inflation outlook (S)
- The UK current account deficit and all that (S)
- A shift in the balance of risks (S)
- What do we now know about currency unions? (S)

#### 2006 Q3

- The UK international investment position
- Costs of sovereign default
- UK export performance by industry
- The Governor's speech in Edinburgh, Scotland (S)
- The Governor's speech at the Mansion House (S)
- Stability and change (S)
- Financial system risks in the United Kingdom (S)

#### 2006 Q4

- The economic characteristics of immigrants and their impact on supply
- Recent developments in sterling inflation-linked markets
- The state of British household finances: results from the 2006 NMG Research survey
- Measuring market sector activity in the United Kingdom
- The Governor's speech at the Great Hall, Winchester (S)
- Trusting in money: from Kirkcaldy to the MPC (S)
- The Governor's speech to the Black Country business awards dinner (S)
- International monetary stability — can the IMF make a difference? (S)
- The puzzle of UK business investment (S)
- Hedge funds and financial stability (S)
- Practical issues in preparing for cross-border financial crises (S)
- Reflections on my first four votes on the MPC (S)
- Prudential regulation, risk management and systemic stability (S)
- Globalisation and inflation (S)

# 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](http://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](http://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. 286** Modelling the cross-border use of collateral in payment systems (January 2006)  
*Mark J Manning and Matthew Willison*

**No. 287** Assessing central counterparty margin coverage on futures contracts using GARCH models (January 2006)  
*Raymond Knott and Marco Polenghi*

**No. 288** The price puzzle: fact or artefact? (January 2006)  
*Efrem Castelnuovo and Paolo Surico*

**No. 289** Defined benefit company pensions and corporate valuations: simulation and empirical evidence from the United Kingdom (March 2006)  
*Kamakshya Trivedi and Garry Young*

**No. 290** UK monetary regimes and macroeconomic stylised facts (March 2006)  
*Luca Benati*

**No. 291** Affine term structure models for the foreign exchange risk premium (March 2006)  
*Luca Benati*

**No. 292** Switching costs in the market for personal current accounts: some evidence for the United Kingdom (March 2006)  
*Céline Gondat-Larralde and Erlend Nier*

**No. 293** Resolving banking crises — an analysis of policy options (March 2006)  
*Misa Tanaka and Glenn Hoggarth*

**No. 294** How does the down-payment constraint affect the UK housing market? (March 2006)  
*Andrew Benito*

**No. 295** Productivity growth, adjustment costs and variable factor utilisation: the UK case (April 2006)  
*Charlotta Groth, Soledad Nuñez and Sylaja Srinivasan*

**No. 296** Sterling implications of a US current account reversal (June 2006)  
*Morten Spange and Pawel Zabczyk*

**No. 297** Optimal monetary policy in a regime-switching economy: the response to abrupt shifts in exchange rate dynamics (June 2006)  
*Fabrizio Zampolli*

**No. 298** Optimal monetary policy in Markov-switching models with rational expectations agents (June 2006)  
*Andrew P Blake and Fabrizio Zampolli*

**No. 299** Optimal discretionary policy in rational expectations models with regime switching (June 2006)  
*Richhild Moessner*

**No. 300** Elasticities, markups and technical progress: evidence from a state-space approach (July 2006)  
*Colin Ellis*

**No. 301** The welfare benefits of stable and efficient payment systems (July 2006)  
*Stephen Millard and Matthew Willison*

**No. 302** International and intranational consumption risk sharing: the evidence for the United Kingdom and OECD (July 2006)  
*Vincent Labhard and Michael Sawicki*

**No. 303** The danger of inflating expectations of macroeconomic stability: heuristic switching in an overlapping generations monetary model (August 2006)  
*Alex Brazier, Richard Harrison, Mervyn King and Tony Yates*

**No. 304** Procyclicality, collateral values and financial stability (August 2006)  
*Prasanna Gai, Peter Kondor and Nicholas Vause*

**No. 305** Bank capital, asset prices and monetary policy (August 2006)  
*David Aikman and Matthias Paustian*

**No. 306** Consumption excess sensitivity, liquidity constraints and the collateral role of housing (August 2006)

*Andrew Benito and Haroon Mumtaz*

**No. 307** Fiscal rules for debt sustainability in emerging markets: the impact of volatility and default risk (September 2006)

*Adrian Penalver and Gregory Thwaites*

**No. 308** Optimal emerging market fiscal policy when trend output growth is unobserved (September 2006)

*Gregory Thwaites*

**No. 309** Fundamental inflation uncertainty (October 2006)

*Charlotta Groth, Jarkko Jääskelä and Paolo Surico*

**No. 310** Returns to equity, investment and Q: evidence from the United Kingdom (October 2006)

*Simon Price and Christoph Schleicher*

**No. 311** The yen real exchange rate may be stationary after all: evidence from non-linear unit root tests (October 2006)

*Georgios Chortareas and George Kapetanios*

**No. 312** Exchange rate pass-through into UK import prices (November 2006)

*Haroon Mumtaz, Özlem Oomen and Jian Wang*

**No. 313** Bank capital channels in the monetary transmission mechanism (November 2006)

*Bojan Markovic*

**No. 314** Consumer credit conditions in the United Kingdom (November 2006)

*Emilio Fernandez-Corugedo and John Muellbauer*

## 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/other/externalmpcpapers/index.htm](http://www.bankofengland.co.uk/publications/other/externalmpcpapers/index.htm)

The following paper has been published recently.

**No. 16** Diverging trends in aggregate and firm-level volatility in the UK (November 2006)

*Miles Parker*

## 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](http://www.bankofengland.co.uk/statistics/ms/current/index.htm).

Following user consultation, printed editions of *Bankstats*, which were previously published twice a year in January and July, have been discontinued since July 2006.

Further details are available from: Lucy Crighton, Monetary and Financial Statistics Division, Bank of England: telephone 020 7601 5353; fax 020 7601 3208; email [lucy.crighton@bankofengland.co.uk](mailto:lucy.crighton@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](http://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 2007, 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](http://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](http://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 series also includes Lecture and Research publications, which are aimed at the more specialist reader. All the *Handbooks* are available via the Bank's website at:

[www.bankofengland.co.uk/education/ccbs/handbooks/index.htm](http://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 (MPC) 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/redbook0506.pdf](http://www.bankofengland.co.uk/markets/money/publications/redbook0506.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. The price of the book is £10.

[www.bankofengland.co.uk/publications/other/beqm/index.htm](http://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](http://www.bankofengland.co.uk/statistics/about/cba.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.

Summary pages of the *Bulletin* from February 1994, giving a brief description of each of the articles, are available on the Bank's website at:

[www.bankofengland.co.uk/publications/quarterlybulletin/index.htm](http://www.bankofengland.co.uk/publications/quarterlybulletin/index.htm).

Individual articles from May 1994 are also available at the same address.

The *Bulletin* is also available from National Archive Publishing Company: enquiries from customers in Japan and North and South America should be addressed to ProQuest Information and Learning, 300 North Zeeb Road, PO Box 998, Ann Arbor, Michigan 48106–0998, United States of America; customers from all other countries should apply to The Quorum, Barnwell Road, Cambridge, CB5 8SW, telephone 01223 215512.

An index of the *Quarterly Bulletin* is also available to customers free of charge. It is produced annually, and lists alphabetically terms used in the *Bulletin* and articles written by named authors. It is also available at:

[www.bankofengland.co.uk/publications/quarterlybulletin/contentsandindex.htm](http://www.bankofengland.co.uk/publications/quarterlybulletin/contentsandindex.htm).

Bound volumes of the *Quarterly Bulletin* (in reprint form for the period 1960–85) can be obtained from Schmidt Periodicals GmbH, Ortsteil Dettendorf, D-83075 Bad Feilnbach, Germany, at a price of €105 per volume or €2,510 per set.

## ***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 over the following two years. The *Inflation Report* is available at:

[www.bankofengland.co.uk/publications/inflationreport/index.htm](http://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 2007 are as follows:

### *Quarterly Bulletin*

Q1	19 March
Q2	18 June
Q3	24 September
Q4	17 December

### *Inflation Report*

February	14 February
May	16 May
August	8 August
November	14 November

### *Financial Stability Report*

April
October



## Quarterly Bulletin, Inflation Report and Financial Stability Report subscription details

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Destination	2007					
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First class/collection <sup>(1)</sup>	£31.50	£27.00	£13.50	£21.00	£10.50	£5.25
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