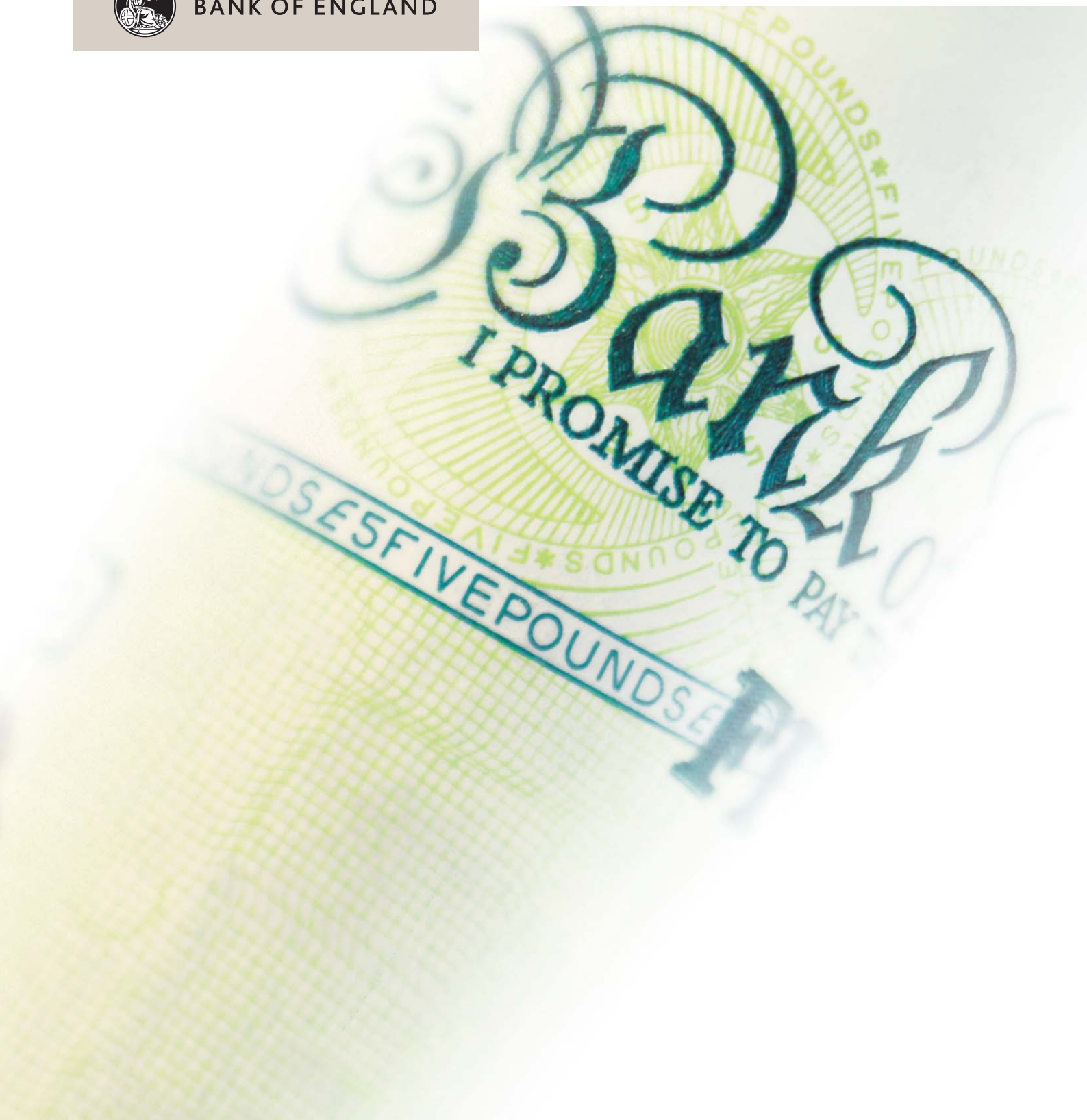
Quarterly Bulletin

2007 Q1 | Volume 47 No. 1

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* reprints evidence on the economic context provided by the Bank to aid the Treasury Committee's inquiry into the first ten years of the Monetary Policy Committee. It also contains articles exploring: the economic consequences of globalisation; the role of household debt in the monetary transmission mechanism; ways of estimating the margin of spare capacity within businesses; the factors determining the level of potential employment; and the macroeconomic impact of migration.

The integration of China and India into the global economy is one of the most important events of our time. In *The macroeconomic impact of globalisation: theory and evidence*, Morten Spange and Chris Young employ a standard economic model to evaluate the likely impact of the integration of these labour-abundant economies on some key macroeconomic variables. They find that though most have responded as theory would have predicted, real interest rates and the pattern of current accounts have not.

Does the build-up of household debt increase the sensitivity of consumer spending to changes in their financial position? In *The role of household debt and balance sheets in the monetary transmission mechanism*, Andrew Benito, Matt Waldron, Garry Young and Fabrizio Zampolli bring together recent Bank of England research examining this question. Perhaps surprisingly, the evidence suggests that there has been rather little difference in the way high and low debt households respond to changes in their financial position. One explanation is that the benign economic environment and favourable lending conditions have made it easier for households to smooth their spending in the face of adverse shocks.

In setting monetary policy, the MPC needs to assess whether demand is moving in line with supply. A key element in this is judging the margin of spare capacity within businesses. In *Gauging capacity pressures within businesses*, Colin Ellis and Kenny Turnbull review a variety of ways to measure spare capacity. Each measure has advantages and drawbacks so it is important to look at a range of measures. Fortunately, the various measures have moved in a broadly similar way over time.

A key determinant of the supply capacity of the economy is the amount of labour that can be put to work. In *Potential employment in the UK economy*, Richard Barwell, Venetia Bell, Philip Bunn and Maria Gutiérrez-Domènech examine the evolution of potential employment in the United Kingdom over recent decades. Rapid population growth, structural changes in the labour market and a fall in the equilibrium unemployment rate, are all likely to have boosted potential employment, offsetting a downward trend in desired working hours.

The macroeconomic impact of international migration, by Richard Barwell, explores the various channels through which inward migration — which has been a substantial driver of UK population growth in recent years — affects the economy. Inward migration raises both supply and demand, but the key issue for the MPC is how the balance between the two is affected. Barwell suggests that evidence points to recent migrant inflows having had a larger impact on supply than demand, therefore tending to suppress inflationary pressures.

The regular *Markets and operations* article reviews developments in sterling financial markets. For the period under review, movements in sterling markets generally seemed consistent with market participants having revised upwards their assessment of the near-term outlook for UK economic growth. Market interest rates rose, prompting an increase in the value of sterling against other major currencies, and there were further increases in UK equity prices. But more recently we have seen substantial turbulence in international equity and credit markets, the full ramifications of which are not yet clear. The article also outlines changes in sterling market structures and reviews the Bank's official operations, including a summary of recent changes to the Bank's documentation for the sterling monetary framework.

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.

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The contents page, with links to the articles in PDF, is available at
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Author of articles can be contacted at
forename.surname@bankofengland.co.uk

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

Recent economic and financial developments

Markets and operations

This article reviews developments since the 2006 Q4 *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. This article also outlines changes in market structures and reviews the Bank's official operations.[1]

Sterling financial markets

Overview

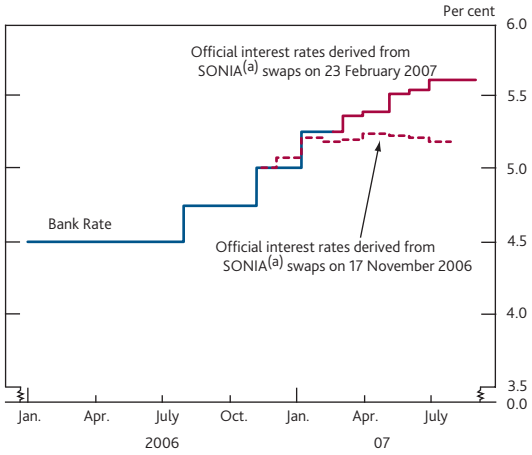
Sterling interest rates rose over the review period. This prompted a further increase in the value of sterling against other major currencies, and was accompanied by further rises in equity prices. These developments seem consistent with market participants having revised upwards their near-term outlook for UK economic growth, following the decision of the UK Monetary Policy Committee (MPC) to increase Bank Rate at its January meeting and some stronger-than-expected macroeconomic data. However, towards the end of the period, these moves in market interest rates and the sterling exchange rate partly unwound.

After the period reviewed in this article, sterling markets were caught up in a period of increased volatility in international capital markets. Global equity markets fell sharply and credit spreads widened, particularly those for low-rated borrowers. Sterling depreciated, particularly against the yen. Market contacts suggested this was partly driven by some traders seeking to close out yen-funded sterling investments — so-called 'carry trades'. At the time of writing it is unclear whether these moves represent a short-term market correction, a widespread reappraisal of the global economic outlook, or a significant change in investors' risk appetite.

Recent developments in sterling markets

The MPC increased Bank Rate by 25 basis points to 5.25% on 11 January. Forward market interest rates also increased, suggesting that market participants had revised upwards their views about the future path of Bank Rate. On 23 February, forward interest rates derived from overnight interest rate swaps were consistent with at least one further increase in Bank Rate by mid-2007 (**Chart 1**). In a survey of UK economists conducted by Reuters in February, the most common view among respondents was that Bank Rate would be 5.5% at the end of 2007, compared with 5% in the November and January surveys (**Chart 2**).

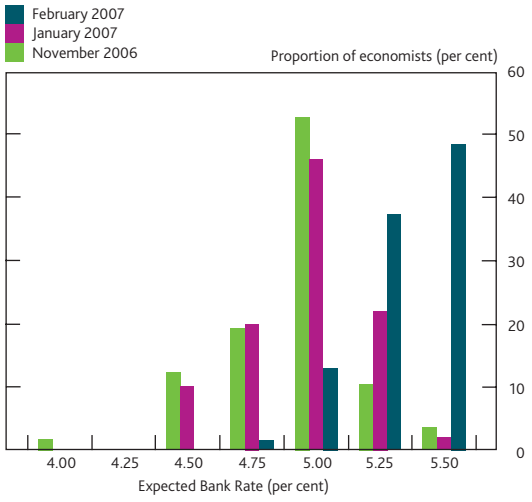
Chart 1 Bank Rate and forward market interest rates



Sources: Bank of England and Reuters.

(a) Sterling overnight index average.

Chart 2 Economists' forecasts for Bank Rate at end-2007(a)



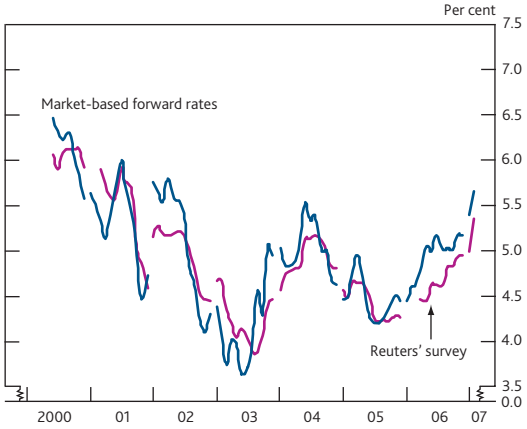
Source: Reuters.

(a) Note that the sample size across surveys can differ. As a result, proportions may change owing to different samples and/or respondents revising forecasts.

(1) This article focuses on developments in sterling capital markets since 17 November (the data cut-off for the previous article). The data cut-off for this article is 23 February.

Following January's rise in Bank Rate, the mean expectation of its future level from the Reuters survey moved closer to market-based measures of future Bank Rate (**Chart 3**).[1] The convergence of these measures suggests that economists' and financial market participants' views about the UK economic outlook and hence the path of future interest rates became more aligned.

Chart 3 Survey expectations and sterling forward interest rates[a]

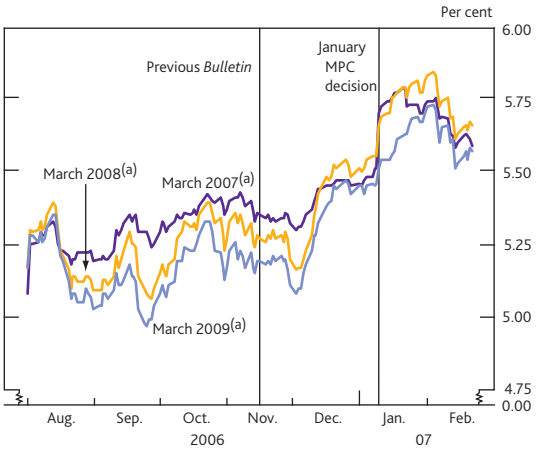


Sources: Bank of England, Bloomberg and Euronext.liffe.

(a) Breaks in each series occur where the data refer to a different calendar year. The chart shows mean interest rate expectations for the end of the full calendar year following the survey date. Forward interest rates are taken from the Bank's bank liability curve, with rates adjusted downwards by a moving average of the spread between six-month Libor rates and six-month GC repo rates to account crudely for the credit risk implicit in Libor rates.

Over the period, the short end of the sterling yield curve rose by around 30 basis points (**Chart 4**). The biggest daily move in market rates coincided with the increase in Bank Rate on 11 January. Implied volatility for near-term sterling interest rates also rose around the time of the increase in Bank Rate. By contrast, implied volatility for dollar and euro rates fell through much of January (**Chart 5**).

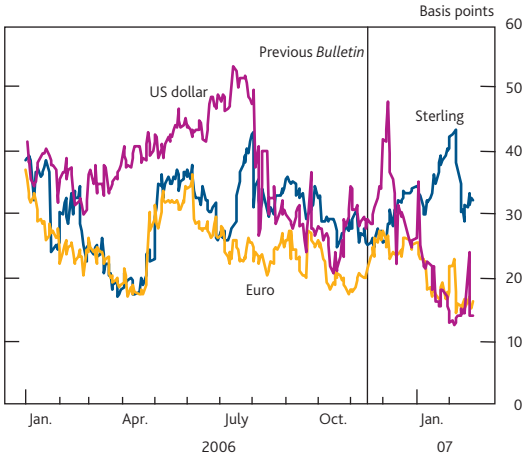
Chart 4 Implied sterling interest rates from short sterling futures contracts



Sources: Bank of England and Bloomberg.

(a) Dates refer to the maturity of the futures contract.

Chart 5 International three-month implied volatility from interest rate options



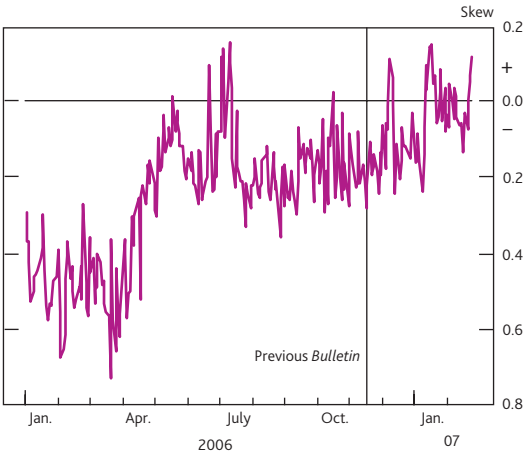
Sources: Bank of England and Euronext.liffe.

Towards the end of the review period, short-term sterling market interest rates and sterling implied volatility fell. This followed the decision not to change Bank Rate at the February meeting and the publication of the February *Inflation Report*. At longer horizons, implied volatilities changed little suggesting that uncertainty about the path of sterling interest rates over the medium term was broadly unchanged.

The skew of the implied distribution of future interest rates moved closer to zero. This may indicate that market participants perceived the risks around the future path of interest rates to be broadly balanced, having been negatively skewed throughout most of 2006 (**Chart 6**).

Against the background of these developments in short-term interest rates, the sterling effective exchange rate index (ERI)

Chart 6 Sterling six-month skew from interest rate options

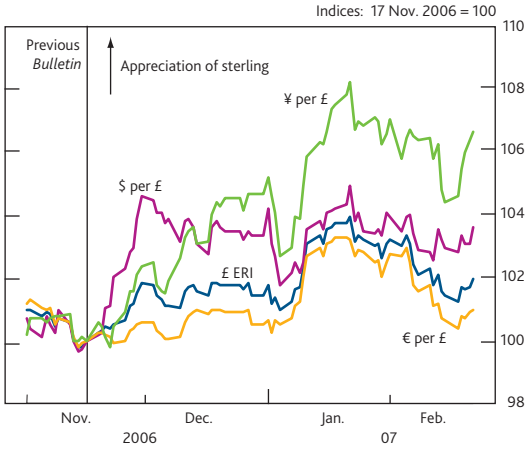


Sources: Bank of England and Euronext.liffe.

(1) The co-movement of market interest rates and survey expectations was discussed in the box, 'Forward rates and economists' expectations' in the Summer 2006 *Quarterly Bulletin*, page 129.

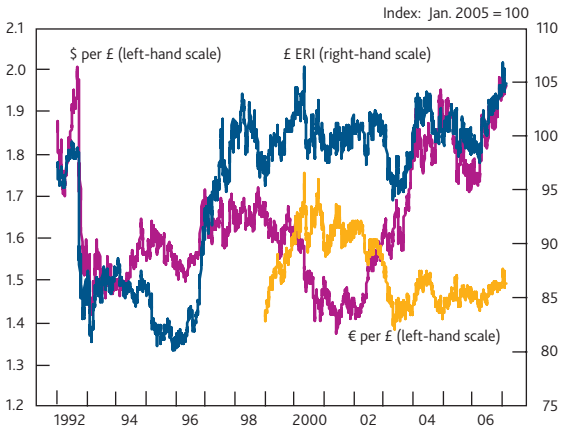
rose by 1.9%. This reflected a broad-based appreciation against the major currencies (**Chart 7**). These moves continued the general increase in the value of sterling that occurred during 2006. Indeed, the ERI reached its highest level (on the basis of the current index construction) of 106.7 on 23 January, when the dollar/sterling exchange rate reached a fourteen-year high of $1.98 (**Chart 8**).(1) Implied uncertainty, derived from options prices, about the future level of sterling was marginally higher by the end of the review period. But both realised and implied exchange rate volatility remained close to their historically low levels (**Chart 9**).

Chart 7 Cumulative changes in sterling exchange rates since November 2006



Sources: Bank of England and Bloomberg.

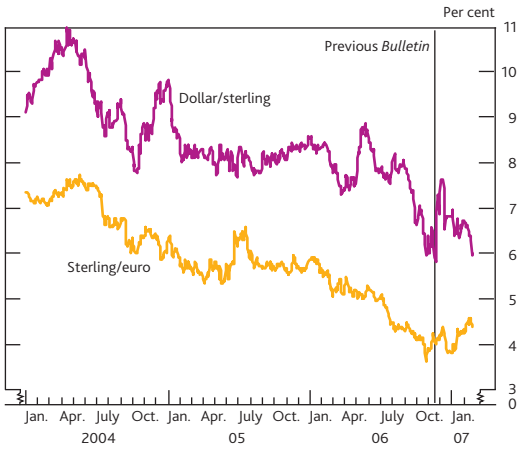
Chart 8 Long-run sterling exchange rates



Sources: Bank of England and Bloomberg.

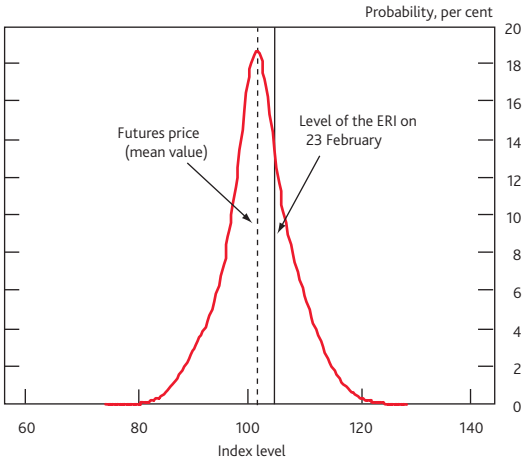
Looking ahead, futures prices suggest that market participants expected the sterling ERI to depreciate a little over the next two years (**Chart 10**). But currency option prices implied that the distribution of expectations for the sterling ERI was roughly symmetric. In other words, market participants believed that large rises in the sterling ERI were as likely as large falls.

Chart 9 Three-month implied sterling exchange rate volatility



Sources: Bank of England and Bloomberg.

Chart 10 Two-year unconditional sterling ERI probability distribution(a)



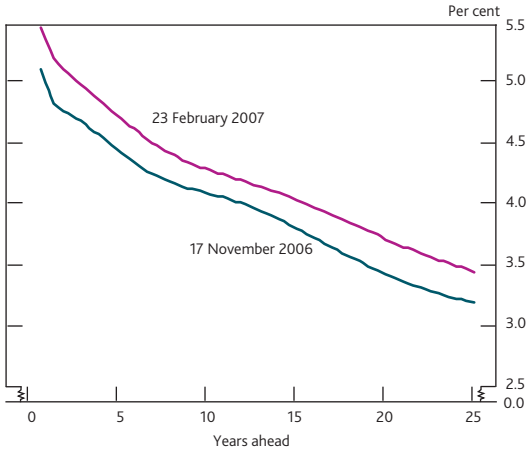
(a) Probability of the sterling ERI being within ±0.5 index points of any given level. For example, the probability of the ERI being at 100 (between 95.5 and 100.5) in two years' time was around 18%. For details of how this probability distribution is constructed see the box on page 130–31 of the Summer 2006 *Quarterly Bulletin*.

Further along the sterling yield curve, nominal forward interest rates increased by around 25 basis points from the low levels experienced in November 2006 (**Chart 11**). This largely reflected higher real interest rates (**Chart 12**). Sterling breakeven inflation rates, derived from the difference between yields on conventional and index-linked gilts ended the period little changed (**Chart 13**).

Despite higher real interest rates, UK equity prices continued to rise over the review period, with particularly strong increases in the share prices of small and medium-sized companies (**Chart 14**). Measures of implied uncertainty about expected future equity prices, derived from options prices,

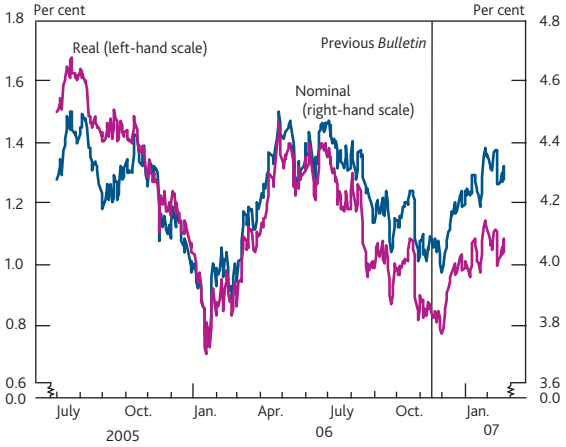
(1) As described in the minutes of the MPC's February meeting, during January the sterling ERI reached its highest level, in both nominal and real terms, since the early 1980s.

Chart 11 Sterling nominal forward rates[a]



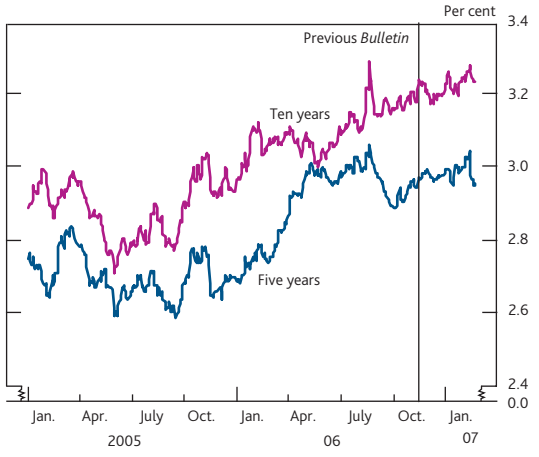
(a) Instantaneous forward rates derived from the Bank's government liability curve.

Chart 12 Sterling ten-year nominal and real forward rates[a]



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

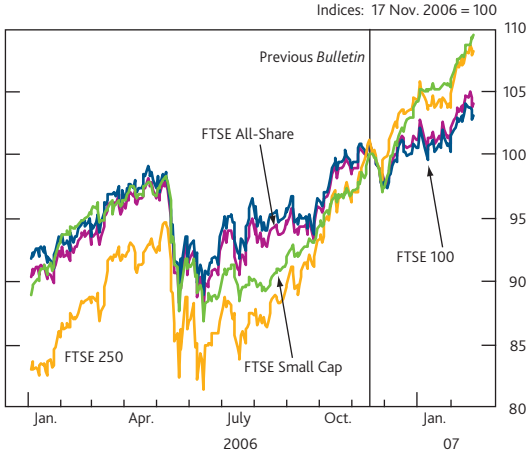
Chart 13 Sterling breakeven inflation forward rates[a]



(a) Implied instantaneous inflation rates five and ten years ahead, based on the difference between yields on nominal and inflation-linked government bonds. The instruments used are linked to RPI, rather than CPI, and so are not directly comparable to the Bank's inflation target.

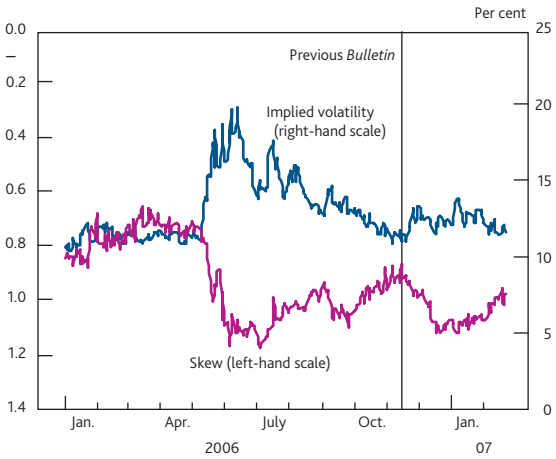
were little changed over the period (**Chart 15**). But the skew of the expected distribution of future equity prices became slightly more negative. Consistent with this, some market commentators have mentioned increased buying of put options to protect against falls in equity prices.

Chart 14 Changes in UK equity indices since 3 January 2006



Sources: Bloomberg and Bank calculations.

Chart 15 FTSE 100 option-implied volatilities and skews[a][b]



Sources: Bank of England and Euronext.liffe.

(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.

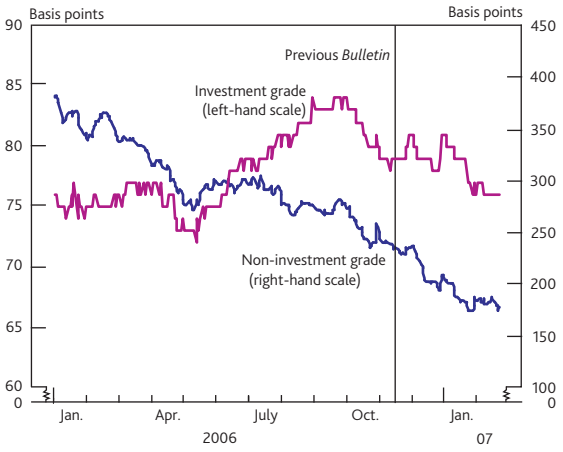
Sterling credit markets remained buoyant and spreads on sterling-denominated corporate bonds narrowed further (**Chart 16**). This was most pronounced for non-investment grade bond spreads, which ended the period at around half the level prevailing at the start of 2006.

Key influences on sterling markets

Monetary policy and macroeconomic news

MPC interest rate decisions and publications have been an important influence on sterling asset prices in recent months. Market interest rates and surveys of sterling interest rate expectations shifted higher around the time of the interest rate decision in January. Contacts suggested that the change was largely unanticipated by market participants. At near-term horizons, market rates increased by up to 17 basis points immediately after the announcement, making this the

Chart 16 Sterling-denominated corporate bond spreads[a]



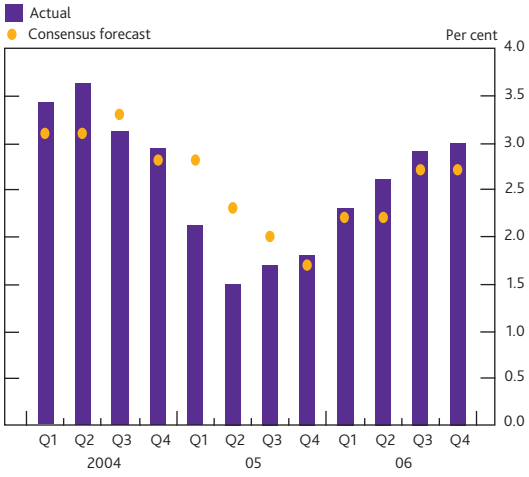
Source: Merrill Lynch.

(a) Option-adjusted spreads.

fourth-largest reaction to MPC-related 'news' since 2001.[1] This was consistent with market participants revising up their outlook for UK economic growth. Subsequently, expectations for future Bank Rate fell following the decision in February to keep rates on hold.

For most of the period, this impression of a robust macroeconomic environment was reinforced by strong data for both real economic activity and inflation. In particular, GDP growth for 2006 Q4 was stronger than expected (measured by survey data). This continued a pattern of stronger-than-expected news on activity observed through 2006 (**Chart 17**).[2] In contrast, during 2005 those surveyed were typically surprised on the downside.

Chart 17 Consensus forecasts of annual GDP growth[a] compared to official data for annual GDP growth[b]

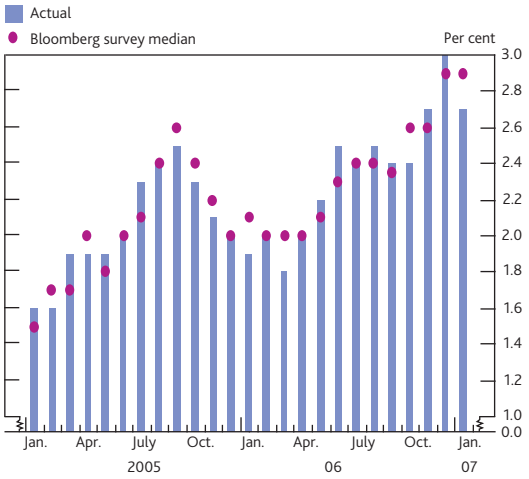


Sources: Consensus Economics and ONS.

(a) Consensus forecasts are conducted in the last month of each quarter — for example, the Consensus forecast for Q4 is undertaken in December.
(b) The official GDP data refer to 'final' estimates in all instances except 2006 Q4, which refers to the 'preliminary' estimate. Typically, these data are released three months after the end of the quarter — for example, the 'final' estimate for 2006 Q4 will be released in March 2007.

Chart 18 shows that CPI inflation outturns were also higher than had been expected for November and December (2006), but not for January. The earlier upside news to inflation may have been interpreted by markets as an indication of a faster pickup in underlying demand conditions.[3] According to market commentators, the weaker-than-expected outturn for inflation in January was an important influence behind the fall in short-term market interest rates towards the end of the period.

Chart 18 Economists' forecasts of annual CPI inflation[a] compared to CPI inflation outturns

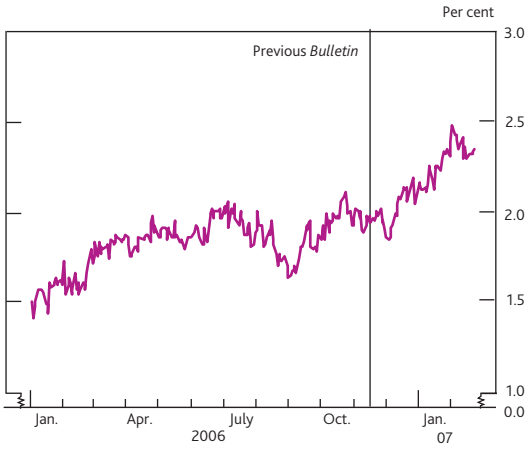


Sources: Bloomberg and ONS.

(a) Bloomberg surveys economists for an estimate of CPI inflation about a week before the official CPI data are released.

Overall, financial markets appear to have revised up their assessment for the near-term outlook for real economic activity in the United Kingdom. Consistent with that, market based measures of short-term real interest rates have risen since the previous *Bulletin* (**Chart 19**).

Chart 19 Sterling two-year real forward rates[a]



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

(1) Defined as policy decision announcements and the publication of the minutes or the *Inflation Report*. See Bell, J and Windle, R, *Quarterly Bulletin,* Summer 2005, pages 169–78.
(2) A caveat to this is that it is not clear whether Consensus survey respondents report GDP forecasts that relate to the early estimates or to the 'final' estimates, or indeed whether this differs across respondents.
(3) The box on page 32 of the February 2007 *Inflation Report* proposed that the recent strength in CPI inflation probably reflected a combination of underlying pressures on demand, the recent increases in the price of energy and imports and possibly a rise in near-term inflation expectations.

Expectations about the future path of Bank Rate have also been an influential factor behind the recent strength of the sterling ERI. As discussed in the February *Inflation Report*, a rise in sterling in response to higher interest rates is part of the transmission mechanism of monetary policy. Higher sterling interest rates relative to foreign currency interest rates increase the relative profitability of sterling assets. This drives up the demand for sterling assets and the sterling exchange rate.

The box on page 12 considers in more detail the extent to which movements in interest rates can explain the recent strength of sterling. It concludes that interest rate movements can account for around 45%–60% of the increase in the sterling ERI since its recent trough in April 2006.

Market contacts have also suggested some additional explanations for the continued strength of sterling, notably the importance of foreign exchange 'carry trades'. A foreign exchange carry trade occurs when an investor borrows in the currency of a country with low interest rates (for example, the yen or Swiss franc) and invests in the currency of a country with higher interest rates (for example, sterling or the Australian dollar).

In theory, market arbitage should ensure that carry trades are not profitable — high interest rate currencies should be expected to depreciate so that the potential gain from interest differentials (or the carry trade) is exactly offset by a fall in the value of the high interest rate currency.(1) However, the recent low levels of realised and implied volatility in exchange rates (**Chart 9**) may mean that investors with a sufficiently short-term investment horizon might anticipate a positive expected return from investing in high interest rate currencies.

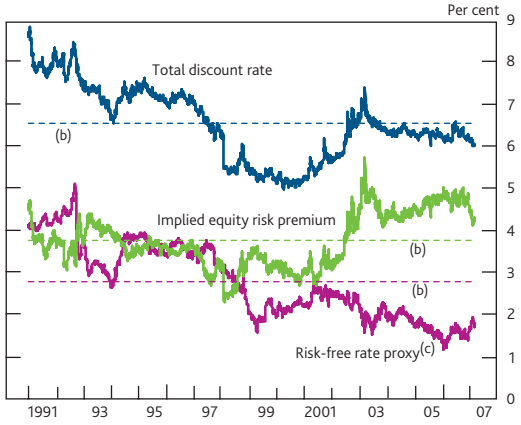
Developments in required risk premia

Alongside signs of a robust macroeconomic outlook, which would tend to support future earnings and underpin continuing low default rates, the compensation required by investors to bear financial risk (ie risk premia) may also have fallen further. Other things being equal, lower risk premia on financial assets would tend to reduce the discount rate on future cash flows and thereby sustain higher asset prices.

According to market contacts, there are few signs that the well-documented 'search for yield' has come to an end, and this could have led to further falls in required risk premia. Indeed, this seems consistent with the further narrowing of sterling credit spreads in recent months. Market contacts suggest the recent narrowing was driven by two main factors.(2) First, the level of corporate defaults was expected to remain relatively low. Second, speculators who had been positioned for wider spreads unwound those loss-making trades and were reluctant to reinstate them.

Risk premia are unobservable. A decomposition of recent developments in the FTSE 100 index using a simple dividend discount model (DDM) suggests that the implied equity risk premium may have fallen since the end of last year (**Chart 20**). But the same decomposition would also suggest that the equity risk premium may have generally drifted higher over the past few years. Such a development, if true, does not sit easily with the continuing low levels of implied equity market volatility, or a further narrowing of credit spreads, typically associated with the ongoing search for yield.

Chart 20 Equity discount rate decomposition(a)



Sources: Thomson Financial Datastream and Bank calculations.

(a) Using a one-stage dividend discount model, with an exogenous long-term dividend growth rate equal to 3%.
(b) Dotted lines represent averages since 1991.
(c) Real yield on long-term index-linked gilts.

One argument that might support increased equity risk premia is that they partly reflect a shift in investors' preferences away from equities and in favour of fixed-income instruments.(3) In particular, over recent years managers of official foreign exchange reserves in Asia seem to have had a preference for fixed-income securities, including sterling-denominated assets. Similarly, UK defined-benefit pension fund trustees and managers have been placing greater weight on investing in bonds since they may better match their liabilities.(4) In both cases, there may have been a shift in demand from equities to fixed-income securities of various kinds, which may have altered relative risk premia between the two types of financial asset.

On average over long periods, bond and equity prices have tended to move in the same direction — higher interest rates (lower bond prices) are typically associated with weakening stock markets. But over the past few years, the correlation between prices of equities and bonds has been unusually negative. This could reflect, at least in part, a change in preferences in favour of bonds (**Chart 21**).

(1) For more details see the box 'Carry trades in the foreign exchange market', *Bank of England Quarterly Bulletin*, Winter 2003, page 401.
(2) For a fuller discussion of the low levels of risk spreads and their determinants see the July 2006 *Financial Stability Report*.
(3) See the speech by Paul Tucker, 'Macro, asset price, and financial system uncertainties', Roy Bridge Memorial Lecture, December 2006 and reprinted in this *Bulletin*, on pages 122–30.
(4) See the box, 'Pension fund valuation and liability driven investment strategies', *Bank of England Quarterly Bulletin*, Spring 2006, page 8.

How much of the recent change in exchange rates reflects changes in interest rates?

The sterling effective exchange rate index (ERI) has appreciated in recent months, continuing the gradual drift higher since April 2006 (**Chart A**). At the same time, expectations about future interest rates have increased. This box considers whether the recent strength in sterling can be explained by the recent moves in market interest rates.

Chart A Sterling exchange rate index

The notion that exchange rate movements are linked to interest rate movements is formally captured by the so-called *uncovered interest parity* (UIP) condition. UIP is based on the idea that arbitrage opportunities should be eliminated by market trading, so that the expected returns on similar assets in different currencies should be the same. Hence, if sterling interest rates are higher than foreign interest rates, the sterling exchange rate must be expected to depreciate against other currencies, in order for investors to be indifferent between holding sterling assets and foreign currency assets. In other words, UIP indicates that future changes in the exchange rate are determined by the difference between the *level* of domestic and foreign interest rates (or the interest rate differential). It is important to note that UIP does not determine the level of the exchange rate.

UIP can also be used to relate *changes* in interest rate differentials to *changes* in the exchange rate. But this only holds under certain assumptions, in particular constant risk premia, constant medium-term exchange rate expectations and perfectly functioning markets. This UIP relationship states that as expectations about future domestic interest rates rise relative to those abroad (ie there is interest rate 'news') there would be an immediate appreciation (or jump) in sterling's exchange rate to a point from where it would be expected to depreciate.

Table 1 documents the movements in sterling since its recent trough in April 2006 and how far they might be consistent with UIP. Line (1) shows that, over this time period, the sterling ERI has increased by 7.4%. Line (2) computes the extent to which changes in the exchange rate can be attributed to changes in interest rate 'news' — to reflect UIP.(1) Interest rate 'news', as defined here, captures unexpected changes in the future interest rate differential over a window of the next eight to twelve years.(2) The table shows that, over the period, changes in interest rate news can explain around 40% to 60% of the rise in the sterling ERI, the sterling-dollar and sterling-euro bilateral exchange rates.

Table 1 Sterling exchange rate movements
5 April 2006–23 February 2007

		£ ERI	$ per £	€ per £
Actual change (per cent)(a)	(1)	7.4	12.2	4.6
Change explained by interest rate 'news' (sensitivity range in percentage points)	(2)	3.3–4.2	6.2–7.6	2.2–3.0

Sources: Bloomberg and Bank calculations.

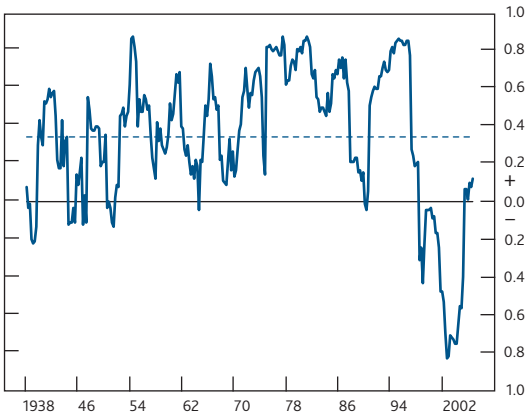
(a) A positive number represents an appreciation of the value of the base currency.
(b) The interest rate differential is calculated using eight, nine, ten, eleven and twelve-year UK and foreign government bond yields. The sensitivity range reports the maximum and minimum values.

The results in **Table 1** suggest that a large part of the strength of the sterling ERI between April 2006 and February 2007 can be explained by movements in expectations about UK and foreign interest rates over the same period.

Of course, it may be that the assumptions underlying UIP do not hold in practice. And indeed, the empirical evidence on whether future exchange rate moves are in accordance with the predictions of UIP is mixed.(3) Some studies have found that exchange rate changes are unrelated to or move in the opposite direction to that predicted by UIP. This may be because, in practice, investors may not be indifferent between domestic and foreign assets and may require a time-varying excess return on foreign assets; the expected medium-term exchange rate may also move over time as economic fundamentals, such as the rate of productivity growth change; and markets may not always work efficiently. However, other studies have found more support for UIP based on different choices of financial instruments and statistical techniques.(4)

(1) For more information on the analytics required to compute line (2), see Brigden, A, Martin, B and Salmon, C (1997), 'Decomposing exchange rate movements according to the uncovered interest parity condition', *Bank of England Quarterly Bulletin*, November, pages 377–89.
(2) The choice of these future time horizons follows previous practice (see *Bank of England Quarterly Bulletin*, Autumn 2003, page 265) and Brigden *et al* (*op cit*).
(3) McCallum, B (1994), 'A reconsideration of the uncovered interest parity condition', *Journal of Monetary Economics*, Vol. 33, No. 1–2, pages 3–24.
(4) See for example, Chinn, M D and Meredith, G (2005), 'Testing uncovered interest parity at short and long horizons during the post-Bretton Woods era', *NBER Working Paper no. 11077*.

Chart 21 Conditional correlation between changes in UK bond and equity prices[a][b]



Sources: Global Financial Data and Bank calculations.

(a) Based on quarterly data between 1938 Q1 and 2006 Q4.
(b) Dotted line represents the historical average.

Of course, it is possible that the simple DDM decomposition gives a misleading impression of developments in equity risk premia. Specifically, it assumes long-term index-linked government bond yields provide a reliable signal of expected future risk-free real interest rates. But these market rates have recently been at historically low levels, in part related to high demand for index-linked gilts. Consequently, when valuing equities, investors may have chosen largely to ignore the falls in real long-term interest rates over the past few years and not adjusted their own discount rates to the same extent. In this case, the 'true' equity risk premium may be lower than suggested by the measure inferred from the simple DDM.

Idiosyncratic influences on equity markets

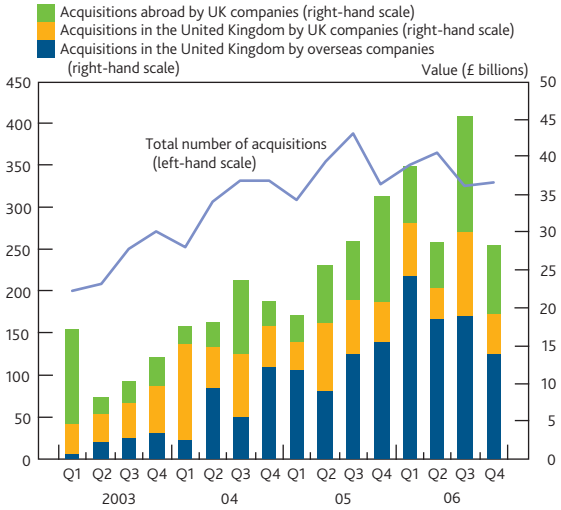
Market contacts have suggested that equity market indices may also have been supported by company and sector-specific developments. In particular, the recent increases in merger and acquisition (M&A) activity, leveraged buyouts and private equity investments seems to have been largely sustained. Although in aggregate the value of acquisitions involving UK companies fell towards the end of last year, the total number of transactions has remained firm, indicating the involvement of small/medium-sized rather than large companies (**Chart 22**).

To the extent that takeovers and buyouts are perceived by investors as potentially increasing companies' revenues or offering possible cost efficiencies, such developments could have boosted equity valuations. Possibly consistent with small and medium-sized companies having been the main beneficiaries of M&A activity and private equity bids, equity prices of these types of firms have increased more sharply than those of large firms.

Longer-term inflation expectations remained anchored

Medium to long-horizon breakeven inflation rates drifted gradually higher through 2006 (**Chart 13**). That could have reflected either an increase in market participants'

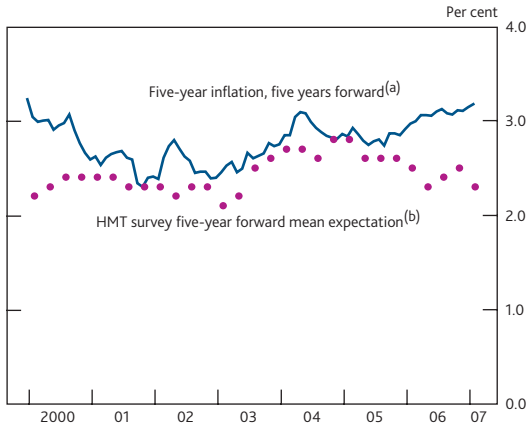
Chart 22 Acquisitions involving UK companies



expectations of future inflation or a larger risk premium to compensate investors for uncertainty about future inflation.

It is difficult to distinguish the influence of these two factors. However, discussions with market contacts did not indicate that there had been any substantial upward shift in long-term inflation expectations, which they viewed as having remained well anchored. And this view is supported by surveys of professional economic forecasters (**Chart 23**). Instead, contacts thought the small increases in breakeven rates might be consistent with an increase in inflation risk premia, due to greater uncertainty about future inflation.

Chart 23 Long-term breakeven inflation rates and surveys of inflation expectations



Sources: Bloomberg, ONS and Thomson Financial Datastream.

(a) Inflation forward rate derived from the Bank's government liability curve.
(b) HMT survey average forecasts of RPIX five years ahead. These surveys are conducted on a quarterly basis, in February, May, August and November. For the latest forecast in February 2007, the forecast was for annual RPIX in 2011.

A small increase in inflation uncertainty may have resulted from recent increases in the level and variability of UK inflation outturns.[1] Furthermore, breakeven inflation rates are derived from instruments that settle on RPI inflation. Hence the

(1) Uncertainty about the near-term outlook for inflation was discussed in the minutes of the MPC's February meeting, paragraph 31.

increase in observed rates may have reflected greater uncertainty about the outlook for RPI inflation that does not apply to the outlook for CPI inflation — the measure that is targeted by the MPC. Indeed, allowing for the historical difference between RPI and CPI inflation, the level of breakeven rates remained broadly consistent with CPI inflation expectations being close to the MPC's target.

At very long horizons (beyond fifteen years ahead), breakeven inflation rates rose by around 20 basis points over the review period. Market contacts report that movements in these rates often reflect the lumpiness of investment and issuance flows in the index-linked market rather than changes in underlying inflation expectations. In particular, against the background of strong demand from institutional investors, at least some of the recent increase in breakeven inflation rates may have been due to a slowdown in issuance of long-dated non-government inflation-linked bonds, which had increased in 2006.

Developments in market structure

Asset managers' use of derivatives

As reported in previous *Bulletins*, over the past few years asset managers have started to make more use of derivatives alongside traditional 'long only' investment strategies, for example using interest rate swaps as part of liability-driven investment solutions for pension funds.(1) Many of the Bank's contacts in the asset management industry expect investments in products and strategies that make use of derivatives to continue to grow. In part, this reflects two new European Directives, together known as UCITS III,(2) which have extended traditional fund managers' investment mandates to include derivatives. Since February 2007, all UCITS funds authorised by the FSA have had to be fully compliant with UCITS III.

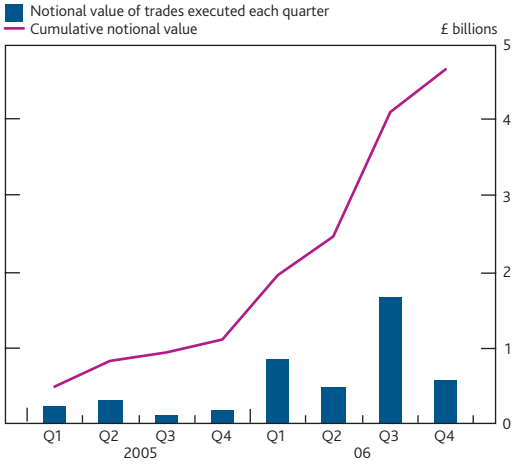
Under the new regulations, UCITS investment funds are authorised to use derivatives for investment as well as hedging purposes. Contacts suggest this should lead to significant changes in business practices, in particular to funds' governance and risk management frameworks. In addition, over time the changes may further blur the distinction between hedge funds and traditional fund managers.

UK property derivatives

Increased use of derivatives by asset managers may be one driver of recent growth in UK property derivative trading. Growth in the market for commercial property derivatives, which began in 2004, increased sharply during 2006 (**Chart 24**).

The main players in the market have been the large mortgage lending banks, institutional asset managers and some large life insurance companies, and banks seeking to hedge structured notes sold to retail investors. Firms that naturally have large property exposure (such as mortgage banks and some life insurers with large property portfolios) use the market for hedging. Other banks and asset managers typically take the other side of these trades (ie they take property exposure). Contacts have suggested that the market became more balanced during 2006; previously there was far more demand to shed property exposure.

Chart 24 Notional value of UK commercial property derivatives trades



Source: Investment Property Databank.

Several large investment banks act as intermediaries in the UK property derivative markets. Dealers typically aim to find clients for both sides of each transaction rather than retaining any exposure themselves. However, the recent growth in the market may have given them greater confidence to 'warehouse' risks. Offsetting these warehoused risks can be difficult as there is no perfect hedge.

Derivatives linked to residential property prices have been much less widely traded; the market has remained more one-sided with mortgage banks seeking to hedge their property lending books but with few investors willing to take on the exposure. Asset managers have been reported as having fewer reasons for using residential property derivatives, possibly because many of their clients already have large residential property exposures.

Recent developments in the sterling market for bank capital securities

Demand from asset managers has been reported as one reason for the issuance of sterling-denominated bank capital securities, which rose sharply during 2006. Market contacts report that many large fund managers (both traditional asset managers and hedge funds) have invested heavily in bank

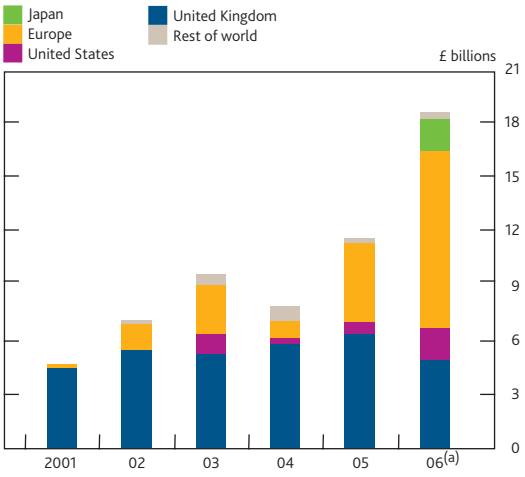
(1) See, for example, McGrath and Windle (2006), 'Recent developments in sterling inflation-linked markets', *Bank of England Quarterly Bulletin*, Vol. 46, No. 4, pages 386–96.
(2) Undertakings in Collective Investments and Transferable Securities (UCITS) are a set of European regulations designed to harmonise the regulatory framework for selling funds across Europe.

capital securities, which are subordinated to senior debt and hence typically offer higher yields.(1) Also, compared with corporates banks are less likely to be targeted for leveraged buyouts, which tend to reduce the value of outstanding debt.

Several other factors may also have influenced the issuance of bank capital securities. On the supply side these include greater emphasis on regulatory-capital management in the banking sector; the growth in risk-weighted assets (which may necessitate a capital injection); and an increase in acquisitions by banks (which are often funded by capital securities).

Banks can issue capital securities in several discrete markets, typically split by the investor base — institutional and retail — and by currency (principally US dollar, euro and sterling). During 2006, growth in issuance was most pronounced in sterling. Indeed, available data suggests sterling-denominated issuance increased by more than 60% year on year (**Chart 25**). The increase was entirely attributable to issuance by non-UK banks (issuance by UK banks actually fell by around 20% year on year). It was the first time that non-UK issuance had exceeded UK banks' issuance.

Chart 25 Issuance of sterling-denominated bank capital securities



Source: Goldman Sachs.

(a) Year to 21 November 2006.

There are three specific factors underlying higher sterling-denominated capital issuance. First, the market reacted to a decision by the US insurance regulator, the National Association of Insurance Commissioners (NAIC). From late 2005, until the issue was resolved in September 2006, the NAIC classified many new issues of hybrid capital securities as common equity rather than debt or preferred stock. This resulted in a marked increase in the capital charge faced by US insurers, which market contacts report account for around a quarter of the institutional investor base in the US dollar market. Consequently, primary and secondary market spreads rose, so banks, especially European, reconsidered US dollar issuance and instead issued in other currencies. Second, according to some contacts, the UK asset management industry has been more comfortable with the duration (including potential maturity extensions), complexity and subordination of capital securities, than its continental European equivalent. In turn, the premium demanded in sterling has been lower than in euro. Third, the rates at which issuers can swap floating-rate cash flows from sterling into foreign currencies (known as basis swap rates) have tended to confer a funding advantage to non-UK banks issuing in sterling.(2) Market contacts note the latter arose, in part, owing to the increased issuance of US dollar and euro-denominated (tranches of) retail mortgage-backed securities (RMBS) by the UK banks.

Project Turquoise

Seven of the largest equity dealers have announced their intention to create a multilateral trading platform for European equities, known as 'Project Turquoise'. A trading platform is an electronic system in which multiple participants have the ability to execute trades by accepting bids and offers made by other participants in the system. Shares traded on this platform will continue to be listed on exchanges. Project Turquoise will attempt to capture high volume, low margin 'black box' or automated rule driven trading.

The launch of this platform is intended to coincide with the introduction of the Market in Financial Instruments Directive (MiFID) in November 2007. MiFID will enable Multilateral Trading Facilities (MTFs) such as 'Project Turquoise' to compete more effectively with stock exchanges, through the removal of domestic rules favouring trading on stock exchanges.

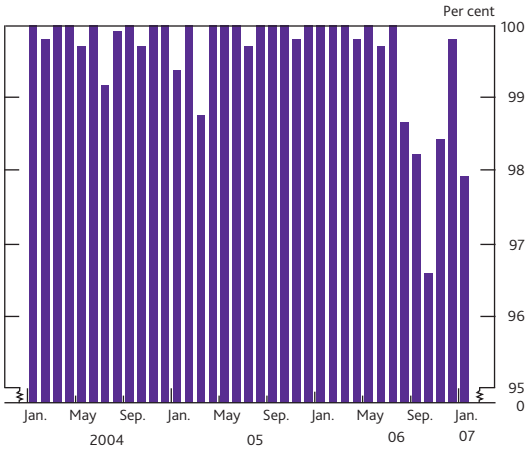
CREST settlement

The 2006 Q4 *Quarterly Bulletin* reported that CREST had taken steps to improve performance. This was in response to a short period when CREST settlement was completed later than scheduled owing to problems encountered following the transfer of major aspects of CREST settlement to Euroclear's Single Settlement Engine (SSE) in August 2006.
Reflecting these changes, the settlement timetable returned to normal. CREST 'outages' were fewer and the time that the CREST system was available for settlement was more than 99.5% in December 2006 (**Chart 26**).

However, there were some more recent incidents. For example, a software release generated errors that triggered a very significant CREST 'outage' during the morning of 22 January and led to a very late close of sterling payments. In addition, there were a small number of short service interruptions, some of which had resulted in extensions at the

(1) Capital securities are so-called 'hybrids': fixed-income instruments that have equity-like properties.
(2) For more details on basis swaps see the box on page 120 of the Summer 2004 *Quarterly Bulletin*.

Chart 26 CREST system availability for settlement



Source: CRESTCo.

end of the day.(1) As noted in the box on page 18, issues surrounding the implementation of the SSE were discussed by the Bank's Securities Lending and Repo Committee.

Bank of England official operations(2)

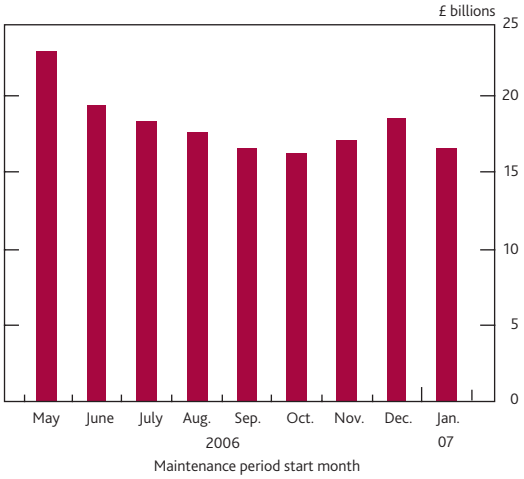
The Bank's management of its balance sheet is directed to policy purposes. Changes in the Bank's assets and liabilities are, accordingly, related to the implementation of monetary policy through establishing Bank Rate in the money markets; management of the Bank's foreign exchange reserves; provision of banking services to other central banks; provision of payment services for the UK financial system and the 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 Bank's balance sheet fell over the review period, in part reflecting slight falls in the notes in circulation (**Table A**). These falls were partially offset by bank and building society reserves-scheme members opting to increase their aggregate target reserve balances.

Between May and October 2006, members of the reserves scheme generally reduced their reserves targets as they became more familiar with the new regime. However, there was a notable increase in reserves targets for the maintenance period starting 6 December, which spanned the year end (**Chart 27**). This may have been due to increased uncertainty surrounding customer flows over the year end and reserves-scheme members therefore wishing to hold more reserves over this period to absorb any unanticipated payment flows.

Chart 27 Aggregate reserves targets



During the run-up to the first calendar year end under the new framework, several market contacts had expected market interest rates to rise as some banks were believed to have put limits on interbank lending and reduce the size of their risk-weighted assets for regulatory and internal reporting purposes. In the event, there was indeed a rise in the spread between Bank Rate and unsecured overnight interest rates, which increased to 20 basis points (**Chart 28**). The impact was similar to the effect of the half-year end in June. Market contacts reported that there was ample liquidity over the year end.

Table A Simplified version of Bank of England consolidated balance sheet(a)(b)

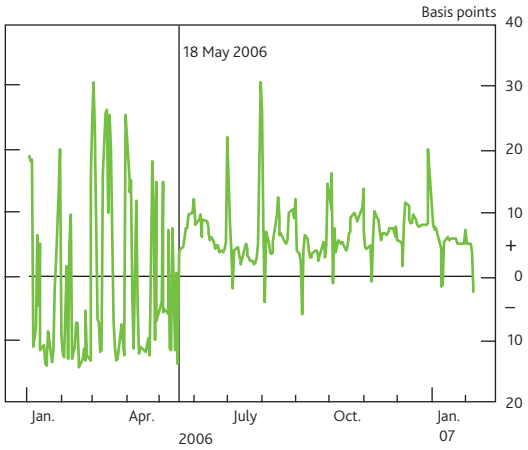
£ billions

Liabilities	7 Feb.	8 Nov.	Assets	7 Feb.	8 Nov.
Banknote issue	38	39	Short-term sterling reverse repo	31	31
Reserves account balances	17	16	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	12	13	Standing facility assets	0	0
Foreign currency denominated liabilities	13	12	Other sterling-denominated assets	4	4
			Foreign currency denominated assets	15	16
Total(c)	**78**	**80**	**Total**(c)	**78**	**80**

(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.

(1) For more details, see Chapter 2 of the Bank's *Payment System Oversight Report*, February 2007.
(2) This section reviews the three maintenance periods from 9 November to 7 February.

Chart 28 Spread to Bank Rate of unsecured sterling overnight interest rates[a]

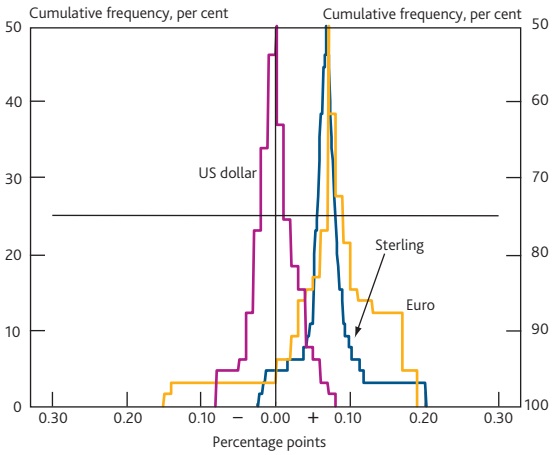


Sources: Wholesale Market Brokers' Association and Bank calculations.

(a) Sterling overnight index average fixing less Bank Rate.

Other than at the year end, overnight unsecured interest rates continued to trade fairly close to Bank Rate and day-to-day volatility of unsecured sterling rates continued to compare favourably to that of overnight rates in other currencies (**Chart 29**). The tendency for unsecured overnight rates to increase at month ends, which has been reported in previous *Bulletins*, was less evident during the current review period. Reflecting this, the range of rates at which overnight unsecured trades were executed, relative to Bank Rate, narrowed further during the period, with the vast majority of trading occurring within a 10 basis points range (**Chart 30**).

Chart 29 Folded cumulative distribution[a] of spread of international unsecured overnight interest rates to official interest rates[b]

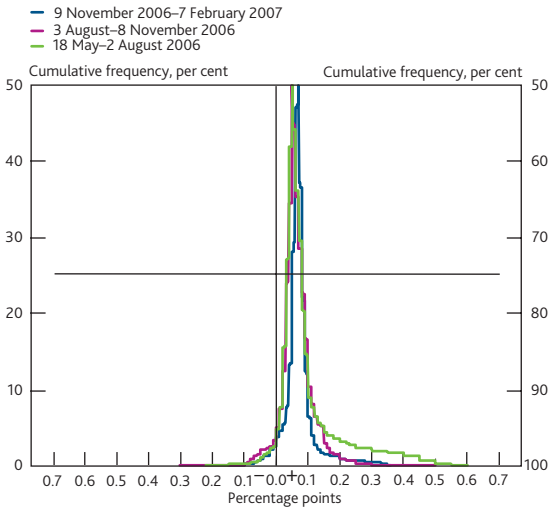


Sources: Wholesale Market Brokers' Association and Bank calculations.

(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 the distribution for period 9 November 2006–7 February 2007. Differences in the median level of the spread of unsecured rates to official interest rates are due to differences in the way official operations are conducted.

Secured overnight market interest rates also tracked Bank Rate closely. There were no episodes similar to the end of July 2006

Chart 30 Folded cumulative distribution[a] of spread of sterling unsecured overnight interest rate (trade weighted) to Bank Rate

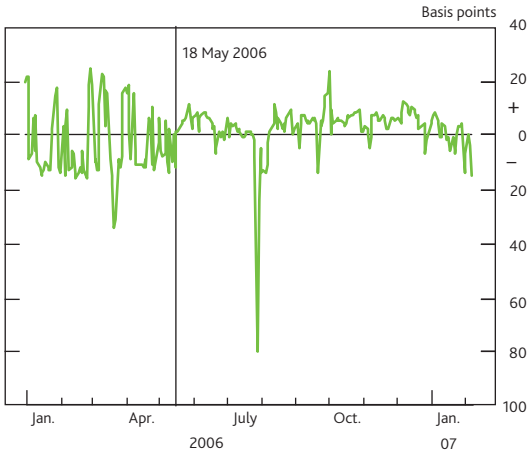


Sources: Wholesale Market Brokers' Association and Bank calculations.

(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.

when secured rates fell sharply. However, in late January, an apparent shortage of gilt collateral caused secured rates to fall, narrowing the spread between overnight secured rates and Bank Rate (which for short periods was negative) (**Chart 31**) and causing the spread between secured and unsecured rates to widen.

Chart 31 Spread to Bank Rate of secured market interest rates[a]



Sources: ICAP and Bank calculations.

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

In the Bank's new operational framework, overnight market interest rates should be kept in line with Bank Rate during the monthly maintenance periods given the possibility of active management of reserves by members. 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 32** shows the sum of (the

The work of the Securities Lending and Repo Committee

The Securities Lending and Repo Committee (SLRC), chaired by the Bank, was formed in 1990. It provides a forum for discussion of market, infrastructure and legal developments in securities lending and repo markets. The SLRC includes representatives of international repo and securities lending practitioners, together with bodies such as CREST, the UK Debt Management Office, LCH.Clearnet, the London Stock Exchange and the Financial Services Authority. Further background on the SLRC can be found in the Summer 2006 *Quarterly Bulletin*.

Over the past year, the SLRC has discussed developments in the infrastructure supporting the UK securities lending and repo markets, including:

LCH.Clearnet gilt DBV repo clearing project

The new service aims to introduce the benefits of a central counterparty, including netting, for repos against bundles of gilts selected using the DBV service offered in CREST. It is scheduled to be introduced on 14 March 2007 following successful testing with around 20 market participants. The SLRC has discussed the potential impact on sterling liquidity flows. SLRC members were also interested in the amount of trading that would move to the new platform and the extent to which balance sheet netting would be permitted by the product as this would allow a more efficient use of capital for participants who trade on both sides of the repo market.

CREST Single Settlement Engine (SSE)

The SSE was launched on 29 August 2006. Following its introduction, there were several issues that led to CHAPS extensions and extensions to the DBV (Delivery-by-Value) settlement timetable (as discussed on page 15). The SLRC discussed the impact of these extensions on the repo market and also provided one forum for CREST to outline their implementation schedule of system improvements to resolve these issues. In particular, the SLRC discussed contingency arrangements in the event that DBVs failed to settle. The Bank outlined to the Committee some of the tools available in its new sterling money market framework for participants to manage banking system liquidity in the event of market disruption. The SLRC also proposed that CREST should discuss the actions that would be appropriate for euro and US dollar positions with its customer banks. The SSE achieved a much greater degree of stability after the initial post-implementation issues were resolved.

The SLRC's market participant members have also continued to review the impact of proposed regulatory changes affecting securities lending and repo markets, in particular two new EU Directives:

The Transparency Directive

The Transparency Directive took effect from 20 January 2007 and contained requirements regarding notification of interests in shares in securities lending transactions. SLRC practitioner members had raised concerns about the limited value of disclosing all securities lending activity. The requirements were implemented in a way that meets the requirements of the Directive while being workable and cost-effective for market participants. Lenders are exempt from making major shareholding disclosures, by allowing them to treat their right to recall lent stock as an 'acquisition' to be set-off against their lending ('disposal') of the stock. The notification requirements apply to securities borrowers, although intermediaries that borrow securities that are then on-lent within one business day and do not exercise voting rights are also exempt.

The Markets in Financial Instruments Directive (MiFID)

MiFID is due to be implemented in November 2007. It is likely that MiFID's implications for repo and securities lending will be limited; for example, the best execution requirement will not apply to repo and security lending transactions conducted between Eligible Counterparties (over 90% of the total securities lending market). The SLRC continues to review the interpretation of best execution requirements and their effect on repo and securities lending activities.

Proposed amendments to the FSA's New Collective Investments Scheme sourcebook

The SLRC has discussed several modifications proposed to the sourcebook, including extending the list of permitted counterparties with which securities lending may be undertaken and extending the list of acceptable collateral, and also permitting the use of Euroclear Bank's Securities Lending and Borrowing Programme. The group also discussed proposed rules on the treatment of income generated by securities lending programmes and recommended further workshops to ensure that the treatment takes into account, where relevant, how the custodians manage their lending programmes.

Gilt Repo Code

Following a recent consultation exercise with market participants and discussions in SLRC, it has been decided to update the Gilt Repo Code. A Working Group which will produce the updated code is being established.

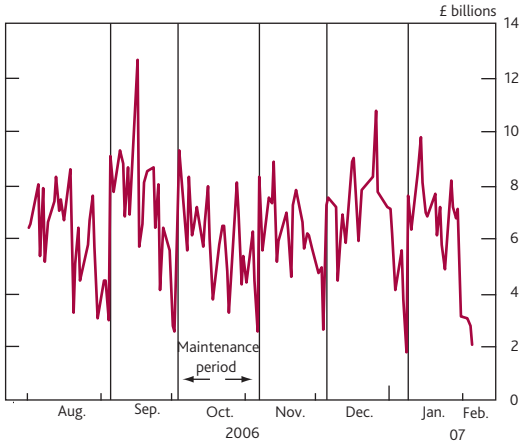
Review of the Global Master Securities Lending Agreement (GMSLA)

A review of the GMSLA is under way, covering tax, legal and operational aspects. A draft version of the updated agreement will be reviewed by the SLRC in due course.

Harmonising the gathering of legal opinions across jurisdictions

An SLRC subgroup, comprising trade association representatives and legal advisers, is responsible for obtaining legal opinions on the effectiveness of the close-out netting provisions in the GMSLA, the Overseas Securities Lender's Agreement (OSLA) and the Master Gilt Edged Stock Lending Agreement (GESLA) under various jurisdictions throughout the world. UK authorised firms are required to obtain these legal opinions in order to support the reporting of securities lending exposures to the FSA (on a net basis) for capital adequacy purposes. The SLRC and the subgroup have continued to discuss the harmonisation of this exercise in gathering legal opinions with the similar process organised by the International Capital Market Association (ICMA) and the Securities Industry and Financial Market Association (SIFMA) for repo transactions under the Global Master Repurchase Agreement (GMRA). That would probably yield cost savings and efficiency gains for participating firms. It has been agreed to harmonise this process beginning in the 2007/08 opinion-gathering round. In addition, the subgroup have been reviewing the harmonised format for the opinions and will consider the coverage in terms of counterparty and jurisdiction.

Chart 32 Management of reserve accounts[a]



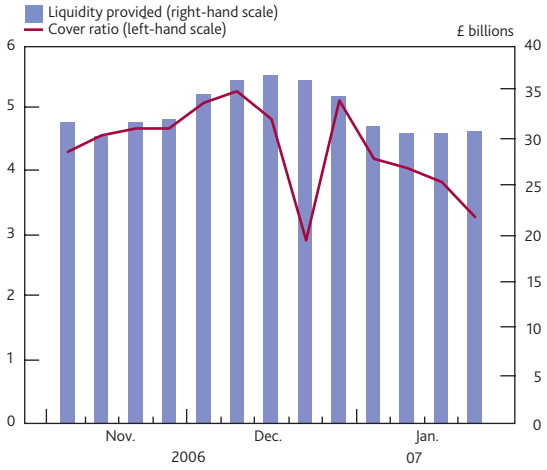
(a) The line indicates the extent to which reserves-scheme members were actively managing their reserve accounts. For each day, it sums the absolute difference between each member's observed balance and the average balance it would have needed to hold in order to hit its reserve target. Higher values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

absolute value of) this difference across all reserves-scheme members; a higher value indicates more active reserves management. Over the current review period, active management appears in general to have been similar to that in the review period for the 2006 Q4 *Bulletin*.

To enable reserves-scheme members to meet their chosen target during each maintenance period, the Bank aims to provide through its open market operations (OMOs) the exact amount of cash so that, collectively, all scheme members can achieve their reserves targets exactly, at the mid-point of the +/-1% range around these targets. Reserves-scheme members face interest penalties if they hold a balance outside (either above or below) the target range.

The Bank corrects for any excess or deficient reserves relative to target in its weekly or fine-tune OMOs to ensure that reserves-scheme members are collectively still able to meet their reserves targets exactly. The size of the weekly short-term OMO increased slightly during December, reflecting higher aggregate reserves targets and note demand over the Christmas period (**Chart 33**). Cover (the ratio of bids to the amount on offer) in the short-term OMOs was fairly steady, but dipped slightly around year-end. This may have been because counterparties expected cover to fall and did not want to overbid in case they were allocated their full amount, which would in turn require them to find additional collateral on the last day of the year, when it might be scarce.

Chart 33 Liquidity provided in weekly operations and cover ratio



Three fine-tuning OMOs were conducted. On 6 December, the fine-tune supplied reserves of £1.5 billion. On 10 January, the fine-tune drained £1.8 billion of reserves from the system. This was underbid by £354 million. On 7 February, the fine-tune drained £1.1 billion and was underbid by £212 million.

The Bank's long-term repo OMOs are conducted in variable-rate tenders. They were more than fully covered at each maturity in all operations over the review period. In the January operation, cover fell for the three-month maturity but increased at longer maturities (**Table B**). Yield tails remained small, particularly at nine and twelve-month maturities.

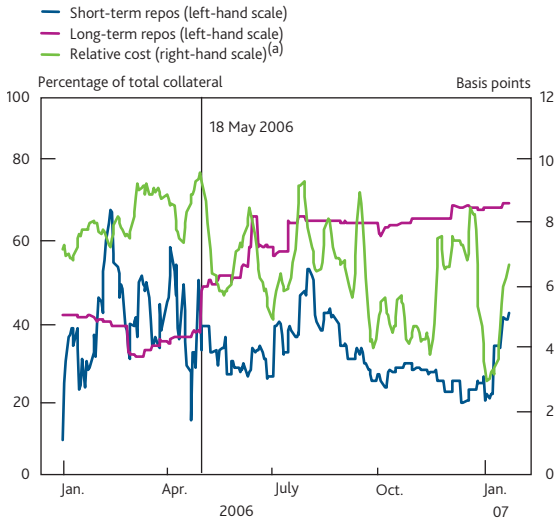
The proportion of euro-denominated collateral provided in the Bank's short-term repo OMOs increased, particularly in January, in line with a decrease in its relative cost (**Chart 34**).

Table B Long-term repo operations

	Three-month	Six-month	Nine-month	Twelve-month
14 November 2006				
On offer (£ millions)	1,500	750	400	200
Cover	3.16	2.02	1.88	2.25
Weighted average rate[a]	5.073	5.152	5.205	5.245
Highest accepted rate[a]	5.075	5.165	5.205	5.245
Lowest accepted rate[a]	5.070	5.140	5.205	5.245
Tail[b] basis points	0.3	1.2	0	0
19 December 2006				
On offer (£ millions)	1,500	750	400	200
Cover	3.23	1.68	1.50	2.35
Weighted average rate[a]	5.153	5.230	5.310	5.360
Highest accepted rate[a]	5.155	5.240	5.310	5.360
Lowest accepted rate[a]	5.151	5.230	5.310	5.360
Tail[b] basis points	0.2	0.5	0	0
16 January 2007				
On offer (£ millions)	1,600	750	400	150
Cover	1.41	2.53	3.27	3.84
Weighted average rate[a]	5.429	5.537	5.625	5.668
Highest accepted rate[a]	5.440	5.540	5.625	5.685
Lowest accepted rate[a]	5.400	5.535	5.625	5.665
Tail[b] basis points	0.3	0	0	0

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

Chart 34 Relative cost and use in OMOs of euro-denominated EEA government securities[a]



(a) Cost of euro-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.

This may have reflected higher demand for gilt collateral in the wider repo market which, as mentioned above, was cited by the Bank's contacts as a reason behind the widening in secured-unsecured overnight interest rate spreads. To help prevent shortages of gilt collateral, in September 2006 the Bank extended the deadline for its counterparties to notify substitutions of euro-denominated for gilt collateral and this facility has been used. As described in the box on page 21, that was one of a series of technical changes to the Bank's sterling monetary operations.

Foreign currency reserves

Reflecting the remit 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.

On 15 December 2006, the Bank announced that the foreign exchange reserves will in future be financed by a new programme of medium-term securities issuance. Issuance under the new programme will be regular, highly transparent, and marketed and distributed via a group of banks. Subsequently on 22 February the Bank announced that Barclays Capital, Citi, Goldman Sachs International and JPMorgan had been appointed to bring a three-year US dollar transaction. The Bank currently expects to execute a $2 billion issue in the week beginning 12 March.

The new issuance programme replaces the previous Euro Note auctions; the final issue under the old programme was therefore the €3 billion nominal Euro Note maturing 27 January 2009. There is one other outstanding Euro Note maturing on 28 January 2008, for €2 billion nominal.

Under current arrangements, the Bank holds approximately €3$^{1}/_{2}$ billion of euro-denominated assets to facilitate the United Kingdom's participation in TARGET. As detailed in the 2006 Q3 *Quarterly Bulletin*,(1) the Bank will no longer participate as a direct member when the European System of Central Banks (ESCB) replaces TARGET with TARGET2.(2) 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 below the €6 billion nominal previously provided by the Euro Note programme.

Capital portfolio

As set out in previous *Quarterly Bulletins*, the Bank holds an investment portfolio comprised of gilts and other high-quality sterling-denominated debt securities together with some short-term repos. This portfolio is approximately the same size as the Bank's capital and reserves (net of equity holdings, for example in the BIS and ECB, and the Bank's physical assets) and aggregate cash ratio deposits.

The portfolio currently holds around £2 billion of gilts and £1 billion of other debt securities. Purchases are typically made monthly, with the exception of December. Details of forthcoming purchases are published in a quarterly announcement on the Bank's wire service pages. Over the

(1) See page 287 of the Autumn 2006 *Bulletin*.
(2) 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.

Technical changes to the Bank's documentation for the sterling monetary framework

On 16 February 2007, the Bank published updated versions of the legal and operational documentation for its sterling money market operations. The documentation was updated to reflect a number of changes on which the Bank had previously consulted market participants and which had also been discussed in the Money Market Liaison Group (MMLG).(1) The main changes are:

1. Full collateralisation of both principal and interest amounts for all term repos entered into with the Bank in its open market operations (OMOs).

This change eliminates the Bank's unsecured intraday exposure to accrued interest on term gilt repos with its OMO counterparties. In future, the Bank's counterparties will be required to deliver securities equal to the adjusted market value of the accepted request for funds (as was the case under the previous policy) *plus* the full amount of interest that will be payable to the Bank at maturity. This change will come into effect for new OMOs on 19 April 2007. Collateral will not be required against the interest payable at maturity on outstanding repos from long-term repo open market operations before 19 April 2007 for which the previous arrangements will continue to apply until maturity ('grandfathering').

2. The removal of the current one-day grace period for breaches of the collateral concentration limit.

The Bank applies an issuer concentration limit to the collateral provided by its OMO counterparties and settlement banks in order to ensure some diversification of the bonds it would hold following a counterparty/settlement bank failure. Under the previous policy, banks had a one-day grace period to address any breaches of the limit. But in response to persistent one-day breaches, the Bank decided to remove the grace period.

3. The introduction of a single, group-level threshold for concentration limits to apply.

The Bank sets a concentration limit such that once the total collateral provided by a single OMO counterpart or settlement bank exceeds £1 billion, the institution must ensure that the securities of any single issuer (other than the UK government or the Bank of England) comprise no more that 25% of the total collateral provided to the Bank. Under the previous policy the threshold applied at institution and not group level. Separate concentration limits for OMO participants and sterling settlement banks that are different legal entities within the same group will continue to apply under the revised policy. Changes to the concentration limit came into effect on 26 February 2007.

4. The extension of the deadlines for some substitutions of collateral.

Partly in response to shortages of gilt collateral which, on occasion, have caused sharp falls in secured interest rates, the Bank has changed its operational timetable to allow for later substitutions of euro-denominated collateral for gilts in repos to which it is a counterparty.(2) This change should help to free up gilt collateral on days when it is in short supply, thereby helping to stabilise secured interest rates. This change took effect at the end of September 2006.

(1) See minutes of the MMLG's meetings in July and October 2006 and February 2007 (www.bankofengland.co.uk/markets/money/smmlg).
(2) For a more detailed discussion of the impact of collateral shortages on secured market interest rates, see the box entitled 'Idiosyncratic volatility in the overnight gilt repo market' in the 2006 Q3 *Quarterly Bulletin*, page 286.

current review period, gilt purchases were made in accordance with the 1 December announcement: £37.6 million in both January and February. In January, the Bank also made two sales from the portfolio as provided for in its market notice.

Report

The Monetary Policy Committee of the Bank of England: ten years on

The Bank of England's submission to the Treasury Committee inquiry regarding the economic context.[1]

Compared to past performance, UK inflation has been low and unusually stable since the inception of inflation targeting, while GDP growth too has been remarkably stable. In part that reflects the effectiveness of the inflation-targeting framework and the current institutional arrangements, particularly by anchoring inflation expectations and reducing the sensitivity of inflation to demand and cost shocks.

But other factors have also provided a benign context for the MPC's efforts: cheaper imports and increased competitive pressures associated with globalisation; and increases in labour supply, associated in part with inward migration. Both have dampened inflationary pressures and reinforced the changes in the inflation process associated with the change in monetary regime. The environment is unlikely to be so benign in the future.

The submission also covers the impact on monetary policy of a number of particular issues that have been relevant to the MPC's deliberations over the past decade: the balance of demand and the exchange rate; money supply and liquidity; asset prices; household debt; and investment.

Introduction

This submission covers the economic backdrop to the first ten years of the Monetary Policy Committee (MPC). In the two decades prior to 1992, the United Kingdom's economic performance was relatively poor, being characterised by volatile growth (**Chart 1**) and episodes of high inflation (**Chart 2**). During this period there were also numerous changes in the macroeconomic policy framework and strategy. In the immediate aftermath of the breakdown of Bretton Woods, inflation control was assigned to incomes policies while fiscal policy was assigned the task of managing demand. That was superseded in 1979 by the adoption of monetary targets as a means to control inflation, coupled with structural reforms to boost growth. In the mid-1980s, an informal exchange rate target replaced the money supply as the lodestar for monetary policy. And from 1990 to 1992, the informal exchange rate target was replaced by a formal one in the shape of ERM membership. The current inflation-targeting framework was born in the aftermath of sterling's exit from the ERM in September 1992.

Economic performance since 1992 stands in marked contrast with the earlier experience. Inflation has been low, close to target and unusually stable.[2] The target was initially defined in terms of RPIX inflation: a range of 1%–4% until May 1997[3] and a point target of 2.5% thereafter. The target was then switched at the end of 2003 to 2% for CPI inflation (which on average has run about $^{3}/_{4}$ percentage point below RPIX inflation). RPIX inflation has averaged 2.6% under the inflation-targeting regime, while CPI inflation has averaged 1.8%. The corresponding figures for the period since the MPC was created in June 1997 are 2.4% for RPIX and 1.4% for CPI. Moreover, inflation has so far not deviated by more than 1 percentage point from the target — the point at which an Open Letter would be triggered — though it has come close on a couple of occasions, most recently in December 2006. That is a much better performance than was expected when the present arrangements were established: calculations at the time suggested that inflation was likely to be more than 1 percentage point away from the target around 40% of the

(1) This memorandum was submitted as evidence to the House of Commons Treasury Committee's inquiry into 'The Monetary Policy Committee of the Bank of England: ten years on' and was first published by the Treasury Committee on 19 February 2007 in *House of Commons Paper No. 299* of Session 2006–07, Ev 1–15. Further information about the Treasury Committee's inquiry can be found on the Committee's website: www.parliament.uk/treascom.

(2) Indeed using data back to 1661, Benati (2006) concludes that the inflation-targeting regime constitutes the most stable macroeconomic environment in recorded UK history.
(3) With the objective that RPIX inflation should be in the lower half of the range by the end of the Parliament.

Chart 1 GDP growth

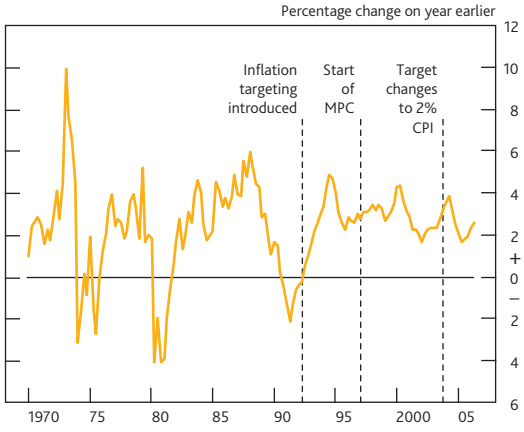
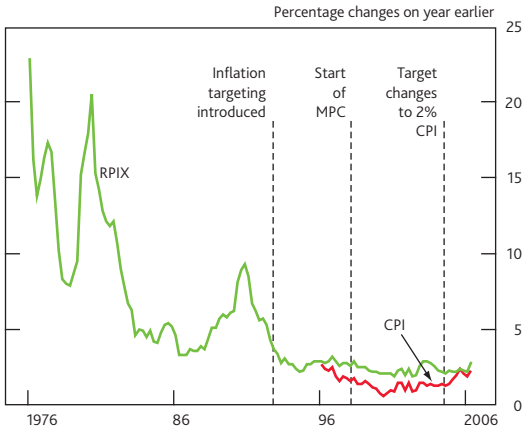


Chart 2 Inflation

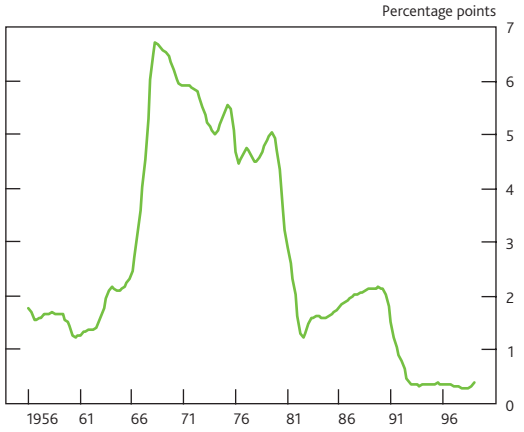


time.[1] And the Bank's own fan charts for the inflation projection have often shown a significant risk that inflation would differ from the target by more than 1 percentage point. This unexpected decline in inflation volatility is documented in **Chart 3**.

The average annual growth rate of GDP since 1992 Q2 has been 2.8%, slightly more than the post-World War II average of 2.5%. And growth is estimated to have been unusually steady, with 58 quarters of unbroken expansion, the longest such run on record. No other G7 country has experienced such a sequence. The decline in the volatility of output is documented in **Chart 4**. Finally, the unemployment rate according to the Labour Force Survey measure, dropped from a peak of a little over 10% in 1993 to under 5% in 2005, its lowest level for almost three decades.

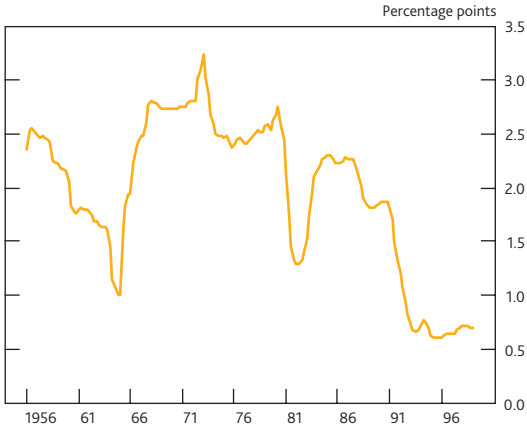
The macroeconomic policy framework has remained broadly stable over this time, with monetary policy set to achieve an inflation target, together with rules for fiscal policy ensuring that fiscal plans are sustainable and continuing structural reforms to raise the economy's supply potential. But the delegation of interest rate decisions to an independent MPC in 1997 represents an important modification.

Chart 3 Volatility of UK inflation[a]



(a) Rolling eight-year standard deviations of four-quarter RPIX (RPI before 1976) inflation. Standard deviations are leading, ie 1997 Q1 observation shows standard deviation from 1997 onwards (for eight years).

Chart 4 Volatility of UK GDP growth[a]



(a) Rolling eight-year standard deviations of four-quarter GDP growth. Standard deviations are leading, ie 1997 Q1 observation shows standard deviation from 1997 onwards (for eight years).

The thinking that underlies this policy framework represents a confluence of advances in our understanding of how the economy functions, together with the lessons of experience. The essential underpinnings can be summarised as follows. In the short run, changes in the nominal demand for goods and services in the economy tend to be reflected in corresponding fluctuations in output. By affecting nominal and real interest rates, and thence a whole array of asset prices, including the exchange rate, monetary policy can therefore alter the level of nominal demand and with it the level of output and employment.

In the long run, however, the level of output and employment depends on the supply potential of the economy, which is determined by the available quantity of real resources — labour, capital, land and other natural resources and the efficiency with which they are combined. If the level of output is running above (below) the level of potential supply, the

(1) See Bean (1998).

result will be upward (downward) pressure on inflation, which will tend to bring demand back into line with supply. In the long run, therefore, monetary policy can determine only the inflation rate, not the level of activity or the growth rate (though consistently poor monetary policy that leads to high and unstable inflation could discourage investment and actively depress growth). But because it can have a temporary impact on activity, the conduct of monetary policy can affect the variability of growth. That is why the statutory monetary policy objective enshrined in the Bank of England Act (1998) elevates the achievement of price stability ahead of any objective for growth and employment, but also why the Chancellor's *Remit* letter gives the MPC a degree of 'constrained discretion' in deciding how quickly to correct any deviation from target, so as to avoid creating excessive volatility in output.

The macroeconomic performance over the past fifteen years represents a striking improvement on the previous 20 years — so much so that some observers have referred to it as the 'Great Stability'. But it would be unwise to conclude that this stability is entirely a consequence of the new monetary framework. Other countries have also experienced a similar, if not so pronounced, improvement in performance (**Table A**). And there have been developments in the global economy that have independently made the achievement of low and stable inflation easier than it might otherwise have been. Even so, those changes have also created new challenges for monetary policy makers here and abroad. The remainder of this submission expands on these and related themes.

Table A Output growth and inflation in selected countries

Output growth[a]

	Average growth rate				Standard deviation of growth rate			
	1950–69	1970–92	1993–97	1998–2005	1950–69	1970–92	1993–97	1998–2005
United Kingdom	2.8[b]	2.0	3.1	2.8	2.1[b]	2.5	0.8	0.7
United States	4.3	3.0	3.5	3.0	3.1	2.6	0.9	1.4
Japan	10.4[c]	4.6	1.7	0.8	2.3[c]	2.5	1.3	1.7
Germany[d]	4.4[e]	2.7	1.3	1.3	2.8[e]	2.2	1.3	1.3
France	n.a.	2.2[f]	1.1	2.2	n.a.	1.1[f]	1.2	1.2

Inflation[g]

	Average inflation rate				Standard deviation of inflation rate			
	1950–69	1970–92	1993–97	1998–2005	1950–69	1970–92	1993–97	1998–2005
United Kingdom	3.9	9.6	2.7	2.5	2.4	5.6	0.7	0.8
United States	2.2	6.0	2.7	2.5	2.0	3.2	0.4	0.9
Japan	4.0	5.4	0.7	-0.3	4.5	5.1	0.8	0.6
Germany	2.2	3.8	2.4	1.4	2.9	2.1	1.1	0.6
France	n.a.	7.7[h]	1.7	1.5	n.a.	4.1[h]	0.4	0.6

Sources: Bureau of Economic Analysis, Global Financial Data, IMF, ONS, Thomson Financial Datastream and Bank calculations.

(a) Four-quarter GDP growth.
(b) 1955–69.
(c) 1958–69.
(d) West Germany prior to 1991.
(e) 1961–69.
(f) 1979–92.
(g) Four-quarter inflation rates based on the retail prices index for the United Kingdom, and consumer price indices for other countries.
(h) 1973–92.

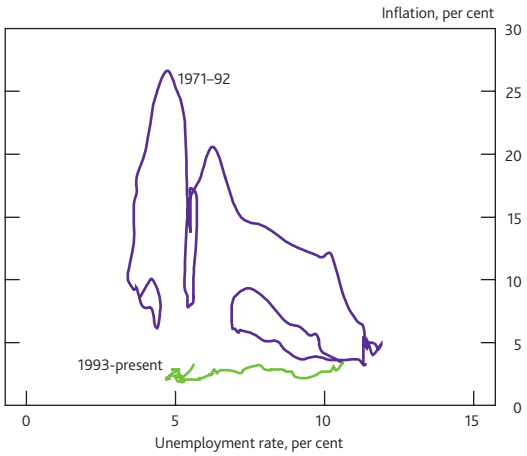
The contribution of the monetary policy framework to the 'Great Stability'

The inflation target and inflation expectations

A key factor in the improved macroeconomic performance is a better understanding of how the economy functions and what role monetary policy can and should play. Through the late 1970s and early 1980s, academics and policymakers alike became increasingly aware that any trade-off between inflation and activity was likely to be temporary and that sustained inflation was ultimately a monetary phenomenon. In addition, the importance of anchoring inflation expectations became clearer. Many wages and prices are changed only periodically. Since workers care about the purchasing power of their wages, while businesses will be concerned about both their costs and competitors' prices, the wages and prices that are set today are influenced by expectations of future levels of prices, wages and other costs. Inflation expectations are therefore central in determining inflation today. Indeed, the most potent effect of monetary policy is not so much through the consequences of individual monthly interest rate decisions, but rather through the ability of the policy framework to condition those expectations.[1]

In a world where inflation expectations are well anchored, an increase in nominal demand relative to supply will lead to a smaller and less persistent increase in inflation than in a world where the increase in nominal demand simultaneously raises expectations of future inflation. The effective anchoring of inflation expectations represents one possible explanation for the apparent flattening of the short-run trade-off between inflation and activity that is suggested by **Chart 5**. (In this

Chart 5 Inflation and unemployment[a]



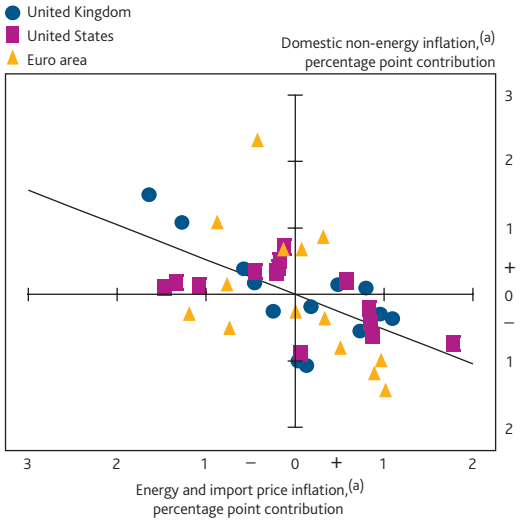
(a) LFS unemployment rate and four-quarter RPIX (RPI before 1976) inflation.

(1) See eg Woodford (2003).

chart, the activity variable is represented by unemployment. The post-1992 experience would therefore be consistent with an unchanged short-run trade-off if actual unemployment had at all times stayed close to the natural rate of unemployment. But it is implausible that activity has been controlled that precisely.)

Moreover, the response to cost shocks — such as the recent increase in the price of oil — is also likely to be attenuated when expectations are well anchored. For a given level of total nominal demand, an increase in the price of some goods will reduce the income left to spend on other goods, so putting downward pressure on those prices. Furthermore, raising prices becomes a less attractive way for companies to respond to higher input costs than seeking ways to reduce other costs. In the 1970s, shocks to energy or import prices generated positive 'second-round' effects on wages and the prices of other goods and services. But **Chart 6** suggests that in recent years, with monetary frameworks in the United Kingdom and elsewhere oriented to maintaining overall price stability, there has instead been an inverse relationship between domestic non-energy inflation and energy and import inflation. So cost shocks need not generate second-round effects in the way that they did in the 1970s.

Chart 6 Contributions to CPI inflation



Sources: Thomson Financial Datastream and Bank calculations.

(a) Percentage point contributions to annual CPI inflation, deviations from 1993–2006 means.

Central bankers around the world now recognise the importance of anchoring inflation expectations. This has led to more emphasis on explaining how policy decisions relate to the objective of price stability, and greater transparency. However, a particular virtue of an inflation target, as opposed to say a money supply target, is that it focuses on the final objective of policy rather than an intermediate objective whose relation to inflation might not be so immediately obvious to the general public. Having an explicit and credible inflation target is likely to have directly contributed to anchoring expectations. But there remain important unanswered questions about how expectations are formed and how credibility is gained and lost. Since independence, the Bank has therefore put considerable effort into improving its understanding in this area and has commissioned its own regular survey in order to track the expectations of the general public.

A related aspect is that a credible framework, together with a well-understood reaction function on the part of the central bank, means that market interest rates and asset prices tend to act as a stabilising force. For instance, if market participants see that demand is running ahead of supply, they will expect the MPC to raise Bank Rate in order to counter the incipient inflationary pressure. That in turn will push up market interest rates and tend to lead the pound to appreciate, dampening demand ahead of any action by the MPC. In this way the market does much of the MPC's work for it; the Governor has termed this the 'Maradona theory of interest rates'.(1)

The role played by the institutional arrangements

Without appropriate institutional arrangements to support the new monetary regime and anchor expectations, it is unlikely that such a good performance could have been sustained. The current framework — based on an explicit target for inflation, a high degree of transparency, and Bank of England independence — made it clear that monetary policy is directed towards maintaining low and stable inflation and that this objective is in place for the long term. The experience of low and relatively stable inflation has helped to reinforce the credibility of the framework and stabilise inflation expectations around the target level. There are a number of features of the current framework that are worth highlighting.

First, delegating responsibility for setting interest rates to an independent Committee has reduced the scope for short-term political considerations to enter into the determination of interest rates. And appointing people with an appropriate level of economic expertise has facilitated the process of forming a view about inflation prospects from the myriad of data and other evidence that the MPC processes each month.

Second, by holding members of the Committee publicly accountable for their votes, the arrangements have sharpened the incentives for members, individually and collectively, to strive to hit the inflation target.

Third, having a regular cycle of pre-announced meetings to determine interest rates has been important in encouraging early action to counter inflationary pressures. This, of course, was a feature of the 1992 reforms; prior to then decisions to change interest rates tended to be reactive rather than proactive.

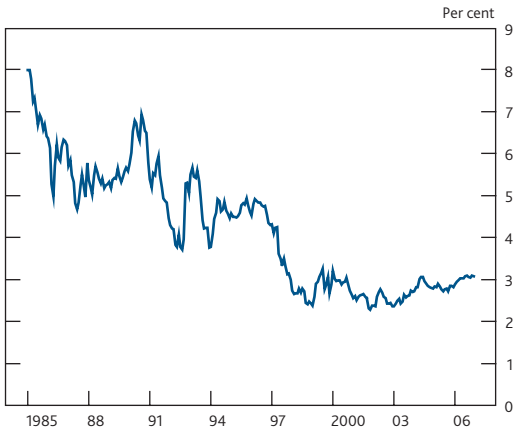
(1) See King (2005a).

Fourth, public understanding of the MPC's thinking is fostered by regular and open communications, including the MPC minutes, the *Inflation Report* and speeches by MPC members. While most of these features were also present under the 1992–97 regime, they have continued to evolve since independence.

Last but not least, the announcement of a clear and credible inflation target reaffirmed annually by the Chancellor has been central. A valuable feature of the arrangements in place since 1997 has been the choice of a symmetrical, point target. Prior to that the target was in the form of a range, but a point target is simple and clear to understand and may have been more effective in anchoring inflation expectations than a range.

All of these features have helped to anchor inflation expectations. As can be seen from **Chart 7**, during the 1992–97 period a measure of long-term (RPI) inflation expectations in financial markets, derived from nominal and indexed gilts, remained around the upper end of the target range. The delegation of the operational responsibility for setting interest rates to the MPC in 1997 was then associated with an immediate credibility gain, with long-term inflation expectations falling sharply to around the new point target. That could have reflected either the virtues of setting a more precise target or the consequence of insulating monetary policy decisions from short-term political pressures.

Chart 7 Long-run inflation expectations(a)



(a) Five-year five-year RPI inflation forwards from UK gilts.

Finally, mention should be made of the supportive fiscal framework. Inflation targeting — or any other monetary framework for that matter — is only likely to be successful if it is accompanied by a prudent and sustainable set of fiscal plans. Though there are a variety of ways that this could be achieved, the MPC has been able to operate against such a background. Fiscal policy has generally been set with an eye to the long term, leaving monetary policy to manage the economy in the short to medium term. That arrangement reflects the current consensus that monetary policy is generally better suited to the active management of the economy, because changes in monetary policy can be speedily implemented. In contrast, changes in taxes or government spending normally require legislation. Moreover, increases in taxes and cuts in public spending tend to be particularly contentious, making temporary fiscal expansions hard to reverse.

A lack of co-ordination between the two main instruments of economic policy has sometimes been seen as an objection to central bank independence. But under the current arrangements, the risk of such a co-ordination problem is greatly reduced. First, the Chancellor sets the Bank's objective, so there should be no conflict in the objectives of fiscal and monetary policy. Second, there is a clear division of roles and responsibilities between the MPC and the Treasury, with each pursuing its role in a transparent and open fashion. This promotes a close understanding between the Bank and Treasury of how the other operates, which is reinforced by close working relationships at staff level, and the presence of a Treasury observer at MPC meetings.

The contribution of other factors to the 'Great Stability'

As noted earlier, the United Kingdom is not alone in having experienced low and stable inflation coupled with stable growth. That suggests that better monetary policy may not be the only factor at work. Some observers have suggested that central banks in general, and the MPC in particular, just happen to have been lucky in that there have been few major economic shocks to handle. However, the past decade does not seem especially tranquil, for instance at a global level we have seen:

- the integration of China, India and the former Communist countries of Eastern Europe into the world economy;
- the ICT revolution and the associated dotcom boom-bust;
- the emerging-market debt crisis and the collapse of LTCM in 1998;
- the sharp correction in international equity prices and the associated global slowdown in 2001;
- the attacks on the World Trade Centre and subsequent conflicts in Afghanistan and Iraq; and
- the tripling of oil prices over the past three years.

While at a domestic level, the MPC has also had to contend with:

- the effects of the 25% rise in sterling between 1996 and 1998;

- the tripling in house prices between 1997 and 2006;
- ongoing labour market reforms, including the introduction of a National Minimum Wage; and
- substantial, and highly uncertain, net inward migration, particularly from the Accession countries.

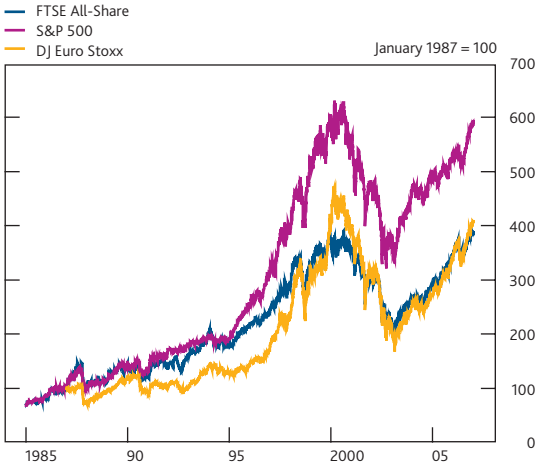
Reflecting this dynamic environment, the prices of domestic and international financial assets have at times moved sharply (**Chart 8**) and equity markets have experienced periods of considerable uncertainty (**Chart 9**). The volatility of the returns on a range of financial assets has not decreased as much as output and inflation volatility (**Table B**).(1) So it does not seem obvious that the economic environment has been markedly less volatile than in the past.

As far as empirical evidence goes, there are some studies, mainly for the United States, which suggest that a sizable portion of the improved performance is related to good luck rather than better policy.(2) However, others have suggested that the role of improved policy has been central.(3) And Ben Bernanke, Chairman of the Federal Reserve, has pointed out that studies which assign a large role to good luck almost certainly understate the role of monetary policy by failing to account properly for the impact of better policy frameworks in reducing the impact of shocks (see pages 26–27).(4) So there is, as yet, no clear consensus as to the relative importance of monetary policy and good luck.

Globalisation

Two particular factors have provided a generally benign backdrop to the MPC's efforts over the past decade, however. The first is the integration into the world economy of

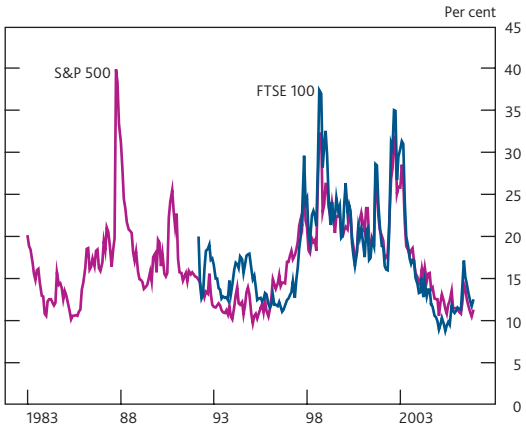
Chart 8 International equity prices(a)



Sources: Bloomberg and Thomson Financial Datastream.

(a) In local currency terms.

Chart 9 Implied equity market volatility(a)



(a) Three-month implied volatility measures, derived from options.

Table B Macroeconomic and asset price annual volatility(a)

	1951–59	1960–69	1970–79	1980–91	1992–2005	2002–05	Percentage change between 1960–69 and 1992–2005	Percentage change between 1980–91 and 1992–2005
S&P 500(b)	14.0	15.7	19.1	12.0	15.2	14.3	-3	27
FTSE All-Share(b)(c)		20.4	43.3	12.1	15.2	21.2	-25	26
Ten-year US Treasury bond(b)	3.4	5.4	7.8	15.4	9.6	6.9	78	-38
Ten-year UK gilt(b)(d)		3.1	11.2	7.7	4.9	3.5	57	-36
Sterling effective exchange rate index(e)			6.9	4.5	2.3	1.0		-49
Dollar effective exchange rate index(e)			5.4	4.4	2.9	3.3		-34
Yen effective exchange rate index(e)			9.9	4.3	4.0	2.0		-8
Euro effective exchange rate index(e)			1.8	3.0	3.0	1.8		-3

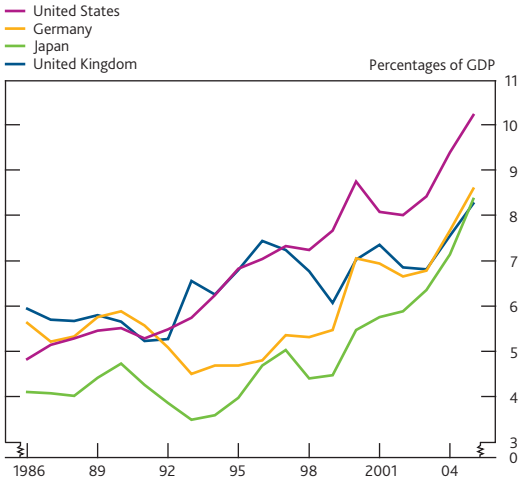
Sources: Bureau of Economic Analysis, Global Financial Data and ONS.

(a) Volatility is calculated as standard deviation of annual growth rates.
(b) Nominal returns deflated by consumption deflators. US Treasury bonds and UK gilts are based on total return indices from Global Financial Data.
(c) FTSE All-Share starts in 1962.
(d) 1960–69 includes 1956–59.
(e) Trade-weighted real exchange rate indices start in 1975.

(1) See Rogoff (2007) and Tucker (2006).
(2) Eg Cogley and Sargent (2005), Sims and Zha (2006) and Stock and Watson (2003).
(3) Eg Clarida, Gali and Gertler (2000) and Lubik and Schorfheide (2004).
(4) See Bernanke (2004).

Eastern Europe, China and India. To all intents and purposes that represents a doubling of the labour supply in the world economy. As these economies are relatively labour-abundant and wages are low, they have a comparative advantage in the production of labour-intensive goods and services compared to the developed economies. This has prompted considerable structural change in the United Kingdom and other developed economies, as the production of labour-intensive manufactures and tradable services has been replaced by imports from low-cost economies or else shifted offshore (**Chart 10**). Of course, this is not a new phenomenon: in earlier decades the emergence of Japan, Korea, Taiwan, etc, generated similar pressures. But what is new is the sheer scale of the shock. Moreover, advances in information technology have made it possible to move offshore parts of the production process in a way that was not previously possible (so-called 'task trade').

Chart 10 Import shares from low-cost economies

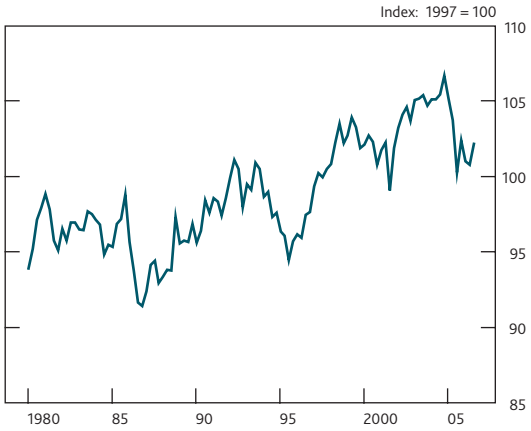


Source: IMF Direction of Trade Statistics.

The globalisation process has affected the environment in which the MPC operates in three main ways.(1) First, the emergence of these low-cost producers has led to a rise in the price of the United Kingdom's exports relative to that of its imports, known as the terms of trade (**Chart 11**). As a consequence, the real purchasing power of employees' wages has been higher than would otherwise have been the case. Historical experience suggests that such terms-of-trade improvements temporarily lower the rate of unemployment consistent with stable inflation. Such a terms-of-trade improvement therefore allows the economy to grow a little faster for the same inflation rate, or else for inflation to fall without requiring growth to dip. Globalisation has in effect provided a beneficial 'tailwind' to the MPC's efforts.

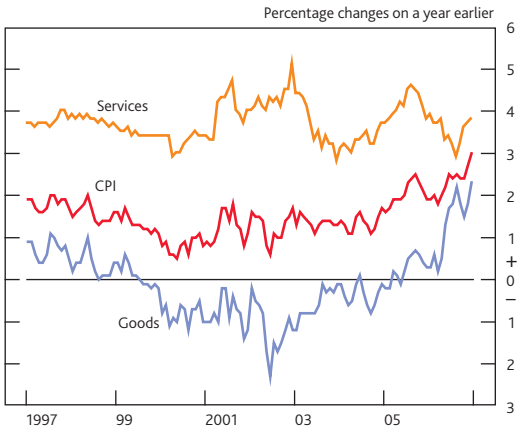
However, such a bonus is likely to be temporary, both because workers' wage aspirations will in due course adjust upwards and because the terms-of-trade improvement will eventually cease, and even unwind, as wages in the emerging economies begin to catch up with their developed economy counterparts. Moreover, the tripling of oil prices since 2004, and the rise in commodity prices more generally, is in large part a reflection of the emergence of these new economies and tends to work in the other direction. This beneficial 'tailwind', and its subsequent attenuation, is reflected in the marked divergence of the inflation rates of consumer goods and services that opened up in the late 1990s and early part of this decade, together with its more recent narrowing (**Chart 12**).

Chart 11 UK terms of trade(a)



(a) Excluding missing trader intra-community (MTIC) fraud.

Chart 12 CPI goods and services price inflation



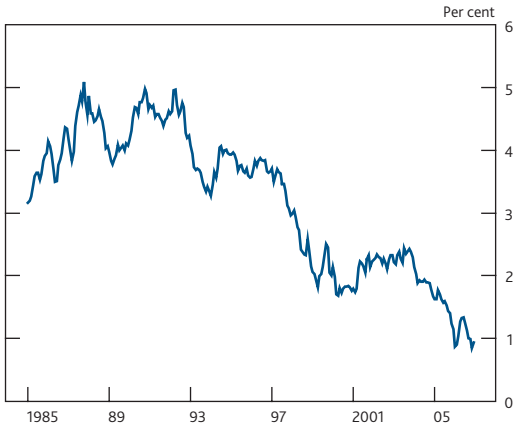
Second, globalisation may have altered the way the economy reacts to shocks. The exploitation of comparative advantage has increased import shares. That means that more of any stimulus to domestic demand tends to leak abroad. Moreover, the increased competitive pressures on businesses may make them less inclined to push prices up when demand increases. So globalisation provides another reason why the short-run trade-off between domestic activity and inflation may have flattened, as suggested by **Chart 5**. And these heightened competitive pressures may also have reinforced the

(1) For a fuller discussion of the impact of globalisation on inflation, see Bean (2006), Borio and Filardo (2006), IMF (2006) and OECD (2006).

attenuation in the response to cost shocks that was noted on page 27.

The third and final impact of globalisation worth recording is the impact on long-term real interest rates. One might have expected the entry of the labour-abundant economies of Asia and Eastern Europe to lead to high investment in those countries, financed by capital inflows, and upward pressure on global interest rates. Investment has indeed been strong, but high savings rates, in China especially, as well as in the oil-exporting countries, has put downward pressure on global and domestic long-term real interest rates (**Chart 13**), boosting global demand.

Chart 13 UK long-term real interest rate(a)



(a) Instantaneous ten-year real forward rate, derived from gilts.

Labour supply

The second generally benign factor has been an expansion in the effective UK labour supply. That has been associated with three drivers: a decline in the natural rate of unemployment; increased labour force participation; and net inward migration, especially from the A8 countries.

The fall in the unemployment rate, from around 10% in the early 1990s to around 5% now (**Chart 14**), has reflected a number of factors. One is the impact of the changed climate of industrial relations and the move to less centralised pay-setting, in part reflecting past legislative changes.(1) An increased onus on the unemployed to look for work, coupled with initiatives to help them find it, has also improved the effectiveness of job search.(2) The decline in the proportion of youths in the labour force, who typically have higher rates of unemployment, has also contributed.(3) And though the introduction of the National Minimum Wage in 1999 may have tended to push up equilibrium unemployment, its impact so far appears to have been relatively limited.(4)

Labour force participation has also edged up (**Chart 15**), as rising female participation more than offset lower male participation and a shift from long-term unemployment into incapacity benefit.(5) Increases in the retirement age, age discrimination legislation, and measures to encourage more flexible working practices are all likely to support higher labour force participation in the future.

Chart 14 LFS unemployment rate

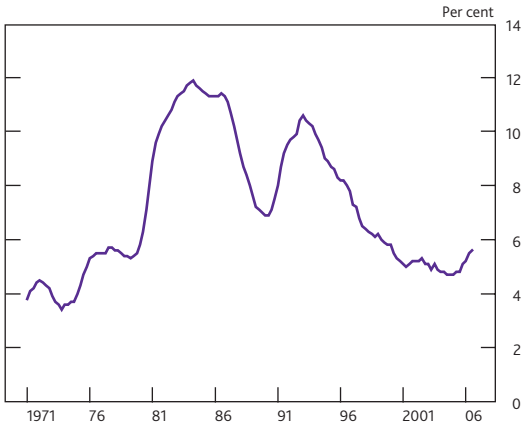


Chart 15 Labour force participation

Finally, the UK labour force has been augmented by a significant rise in net inward migration, especially since May 2004 and the enlargement of the European Union to include eight central and eastern European countries. The data in this area are poor, so it is difficult to know by exactly how much the labour force has been boosted. But it seems likely that migration from the A8 countries has added between 215 thousand and half a million people to the UK labour force since May 2004.(6)

These various structural changes have served to increase the supply capacity of the economy. As the associated increase in incomes is likely to lead to higher demand, particularly if it is also associated with higher investment by businesses, the net

(1) See Layard, Nickell and Jackman (1991) and Kersley *et al* (2006).
(2) See Millard (2000).
(3) See Barwell (2000).
(4) See Dickens, Machin and Manning (1999), Manning (2003) and Stewart (2004).
(5) See Gutiérrez-Domènech and Bell (2004).
(6) See Blanchflower, Saleheen and Shadforth (2007).

impact on inflationary pressures is in principle uncertain. But in practice, it seems likely that the increase in supply did not immediately lead to an equivalent increase in domestic spending, especially since migrants typically remit a substantial fraction of their earnings to their home country.(1) So the increase in the effective labour force has probably tended to reduce inflationary pressures, providing a beneficial 'tailwind' similar to that offered by globalisation.

A second consequence, associated particularly with migration, is also worth noting. Some A8 migrants would have come to the United Kingdom independently of the state of the UK labour market, drawn by the much higher level of wages here than in their home country. But others would only have come if they had a job to go into, or if they believed they could find one relatively easily. And businesses have increasingly directly recruited workers from the A8 (and other) countries when they needed them, often through specialised agencies. So the flow of migrants is likely to be responsive to the state of the labour market, in effect offering a 'safety valve' when it becomes tight and enabling employers to adjust their inputs in response to changes in demand more easily. Moreover, the ability to source workers from overseas has also increased competitive pressures in the labour market, limiting the upward pressure on wages when it tightens. So migration provides yet another reason why the short-run activity-inflation trade-off may have flattened.(2)

Issues

The remainder of this submission addresses a number of particular issues that have arisen over the past decade, some of which are flagged in the Treasury Committee's Call for Evidence.

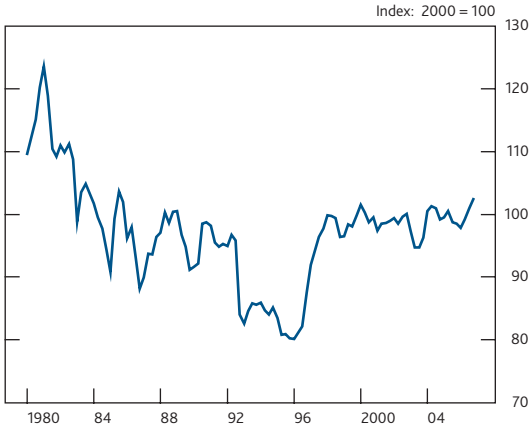
The balance of demand and the exchange rate

A particular feature of the UK economy over the past decade has been the relative reliance on domestic spending — particularly private and public consumption — as the engine of demand growth. Net trade detracted from growth from 1996 to 2004, the longest such sequence on record. That is in contrast to the period from 1993 to 1996, when domestic demand growth was subdued and net trade was a significant driver of demand growth.

This strength of domestic demand has been reflected in the balance of payments. Although the picture is clouded by missing trader intra-community VAT fraud, official estimates for 2005 suggest that the trade deficit was 3.6% of GDP, while the current account deficit was 2.4%. The smaller current account deficit reflects the fact that the United Kingdom runs a surplus on net interest, profits and dividends from abroad, despite being an overall net debtor. In other words, the United Kingdom earns more on its assets than it pays on its liabilities; that in part reflects the fact that its liabilities tend to be more bond-like, while its assets are concentrated in higher-yielding, though potentially riskier, assets.(3)

This current account deficit partly reflects the impact of the sterling effective exchange rate, which, after a period of weakness between 1992 and 1996, returned to levels seen prior to the exit from the ERM (**Chart 16**). That has placed pressure on the internationally tradable sector of the economy (including, but not exclusively, manufacturing). In the early years of the MPC, the appreciation of 1996, and the resulting downward pressure on import prices, therefore reinforced the beneficial 'tailwind' exerted by globalisation.

Chart 16 Sterling effective exchange rate index



A striking feature of the past decade has been the broad stability in the sterling effective exchange rate, despite substantial swings in the dollar-euro exchange rate. That is because appreciations against the dollar have generally been offset by depreciations against the euro and *vice versa*. This broad degree of stability was unanticipated: many people expected the replacement of an exchange rate target by an inflation target to result in more, not less, variability in the effective exchange rate. The explanation may lie in part with the credibility of the monetary framework. The value of the exchange rate today is heavily influenced by what it is expected to be in the future: if the currency is expected to be lower tomorrow, then that will encourage traders to sell it, pushing down its current value. So a credible monetary framework will not only lead to stable long-term inflation expectations (**Chart 7**), but may also help to anchor expectations of future exchange rates.

At some stage the current account deficit will probably need to close. At that point, in order to shift resources from the non-tradable sector of the economy into the internationally

(1) See Blanchflower, Saleheen and Shadforth (2007).
(2) See King (2005b).
(3) See Nickell (2006) and Whitaker (2006).

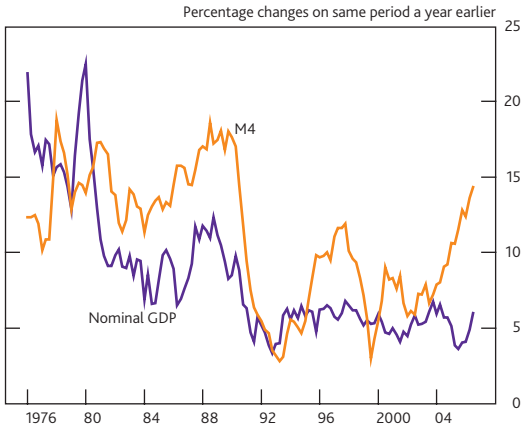
tradable part, some depreciation of the real effective exchange rate will probably be necessary.

Money supply and liquidity

On average, over time and across countries, persistently high rates of broad money growth have been associated with high nominal demand growth and inflation. Sustained and substantial increases in the general level of prices invariably seem to be accompanied by corresponding increases in the money supply. And since the rate of growth of real output is ultimately determined by the quantity of real resources in the economy and the efficiency with which they are used, inflation could ultimately be controlled by targeting the quantity of money if the relationship between money and nominal demand — the velocity of circulation — were stable and predictable.

Unfortunately, although sustained rapid monetary growth tends to be associated with high nominal demand growth and inflation in the long run, the velocity of circulation has turned out to be quite variable over the short and medium term (**Chart 17**). That is because the demand for money holdings can be affected by changes in the relative attractiveness of holding money, such as movements in the returns on alternative assets and innovations that improve the services provided by bank deposits. As a result, most central banks that pursued monetary targets have since ceased actively targeting them. The problems of using a monetary target were aptly summed up by Governor Gerry Bouey of the Bank of Canada who reputedly remarked: 'We did not abandon the monetary aggregates; they abandoned us'.

Chart 17 Broad money and nominal demand



Even so, it would be unwise to ignore the money supply entirely. In recent quarters, UK broad money has grown at higher rates, relative to nominal demand, than at any time since 1990 (**Chart 17**). Investors are likely to take advantage of this ample liquidity and the associated easy credit to purchase other assets, driving risk premia down and asset prices up. Even though the lags may be long and variable, in due course those higher asset prices may be expected to feed through into higher demand for goods and prices, putting upward pressure on the general price level. Moreover, if private agents believe that rapid monetary growth is a harbinger of high inflation to come, then its effects may be telescoped into the present via its impact on inflation expectations and the exchange rate.

The analysis of current monetary developments has been complicated by two factors. First, the recent rapid growth in the money supply has been concentrated in the holdings of Other Financial Companies. This is a collection of heterogeneous institutions that includes pension and private equity funds, entities which in effect intermediate funds between different banks, and financial vehicles whose object is to shift risk off banks' balance sheets. The implications of the activities of each of these for asset prices and future movements in nominal demand are not easy to gauge.

Second, the expansion in liquidity has been a global, rather than a purely national, phenomenon. The increased integration of international capital markets means that the consequences of a loose monetary policy now spill across national borders. Thus investors have taken advantage of ample liquidity and unusually low interest rates in eg Japan to borrow in order to invest in higher yielding assets overseas, boosting asset prices internationally. Money supply measures typically include only holdings by residents and thus fail to capture this dimension properly.

Along with some other central banks, the Bank of England has been struggling to work out how best to take on board the information in the monetary aggregates. The European Central Bank has opted to do this by adopting a 'two-pillar' approach in which an analysis of short-term inflation prospects is complemented by a reference value for money growth. Given the past instability of velocity, the MPC has chosen not to go down this route. Instead it tries to understand the developments in velocity and use the analysis to help isolate the longer-term risks to the inflation outlook.

Asset prices and monetary policy

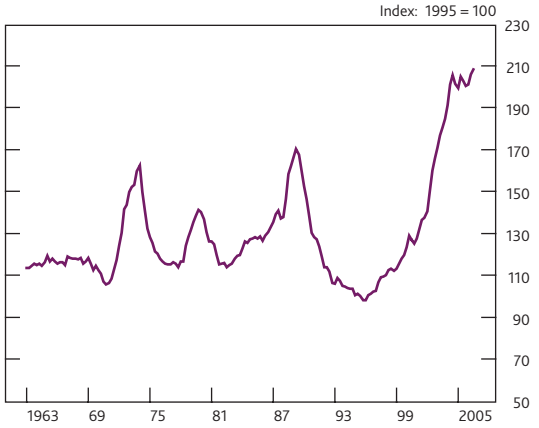
Financial and real asset prices, being forward looking, potentially contain useful information for monetary policy makers. In particular, asset prices reflect not only current demand pressures, but also expectations of future inflation and future income. Unfortunately, it is not straightforward to extract that information, because many factors affect asset prices, which can be quite volatile over short periods. Nevertheless, they represent an important input into the regular deliberations of the MPC.

House prices are a particular asset price that has figured in MPC discussions. While an increase in house prices does not

directly make most households better off — a homeowner can only unlock the capital gain if (s)he is willing to move to a cheaper house — it does increase the collateral against which cash-constrained households can borrow and may thus boost consumer spending through that route. So house prices are one factor influencing consumer spending.(1)

The ratio of house prices to household income is presently around two thirds higher than its historical average (**Chart 18**). In part, that reflects the decline in long-term real interest rates mentioned earlier. It probably also reflects demographic developments that have led to rising demand for homes coupled with relatively low rates of housing investment. And it may also reflect more efficient credit-scoring by lenders. But it is very difficult to quantify the relative importance of these factors, or to make a projection of how house prices are likely to move in the future.

Chart 18 House price to income ratio(a)



Sources: Nationwide and ONS.

(a) Nationwide house price index divided by average earnings index.

Some economists have, however, gone further and argued that asset prices should actually enter the target in some way.(2) That is obviously not consistent with the Government's inflation target as presently specified. Moreover, trying to stabilise asset prices would potentially result in considerable volatility in interest rates, activity and inflation. However, it is possible that a period of sharply appreciating asset prices may raise the threat of a future correction, which in turn might result in a cut-back in lending in response to the decline in collateral, a fall in activity and downward pressure on inflation. In principle, policymakers should take account of that possibility and may therefore decide to raise interest rates and undershoot the inflation target in the near term in order to increase the chances of meeting it further in the future. Moreover, they should also want to reduce the future volatility of inflation and output, strengthening the case for preventing financial imbalances building up in the first place.(3) However, calibrating such a 'leaning-against-the-wind' policy is particularly difficult once account is taken of uncertainty about: the cause of the rise in asset prices; the likelihood and consequences of a subsequent correction; and the uncertainty about the impact of higher interest rates on those asset prices.(4)

Household debt and monetary policy

A feature of the past decade has been the build-up of household debt (**Chart 19**). Secured debt has risen as a proportion of annual post-tax household income from 75% in 1996 to 120% in 2006. Over the same period, unsecured debt as a proportion of household income has risen from 15% in 1996 to 24%. But while debt has grown quickly, in aggregate it has been primarily used to finance real (housing) and financial asset accumulation, rather than spending on goods and services. The net financial position of the household sector has not changed very much since the early 1990s: net financial wealth as a share of household income was broadly the same in 2006 as in 1993. And including real assets, household net worth was higher as a share of post-tax household income, largely reflecting the increased value of housing wealth (**Chart 20**).

Chart 19 Household debt

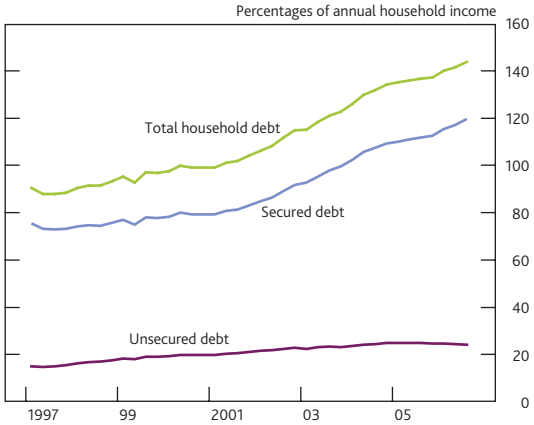
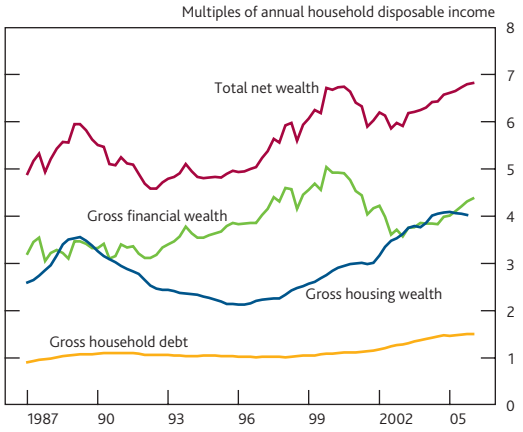


Chart 20 Household assets and liabilities



Sources: ONS and Bank calculations.

(1) See Aoki, Proudman and Vlieghe (2002) on the collateral effect, while Benito *et al* (2006) consider the broader relationship between house prices and consumption.
(2) For conflicting views, see Bernanke and Gertler (2001) and Borio and Lowe (2002).
(3) See Tucker (2006).
(4) See Bean (2003).

The evolution of secured debt — the bulk of household debt — is primarily associated with developments in the housing market. As house prices have risen and the housing stock has turned over, so younger households moving onto, or up, the property ladder have needed to take out larger mortgages, while older households trading down have placed the bulk of the housing equity so released into financial — often relatively liquid — assets. Since it will take many years for all the housing stock to roll over, secured debt can be expected to continue growing strongly for many years to come, even if the house-price-to-income ratio stabilises at present levels.(1)

To what extent should this build-up of debt affect the conduct of monetary policy? Under one view,(2) it is of negligible significance as what matters for household spending is net wealth, not debt. However if, as seems likely, indebted individuals respond more strongly to a rise in their interest payments than do savers to a corresponding rise in their interest receipts, the impact of interest rate changes on demand will be altered. Moreover, even if higher debt is matched by higher assets, the higher leverage involved could amplify the effects of shocks, such as a fall in house prices: a given percentage fall in house prices will generate a larger proportionate fall in wealth in a low price/low debt world than in a high price/high debt one. And the repercussions on lenders' balance sheets and behaviour may also amplify the effects, further complicating the operation of monetary policy.(3)

There is little to suggest that the build-up of secured debt has so far had any significant impact on the economy: repossessions remain at relatively low levels and the Bank's latest annual survey of the borrowers(4) suggests that only one in twelve mortgagees has found any difficulty keeping up their mortgage payments, much less than in the early 1990s. However, the Bank will continue to monitor the situation through its annual survey. It has also recently announced plans for a new survey of credit conditions.(5)

There is more evidence to suggest that the level of unsecured debt might be presenting problems. The Bank's annual survey suggests that around a third of unsecured borrowers find their debt a burden. However, these households are typically low-income households who account for a relatively small fraction of aggregate consumption. So while excessive unsecured borrowing may represent a significant social issue, as yet it does not constitute a material macroeconomic influence.

Investment and monetary policy

Investment is one of the channels through which monetary policy affects aggregate demand (the others being consumption and net trade, via the exchange rate). Around 60% of business investment spending is on capital goods produced in the United Kingdom, so higher investment puts pressure on supply capacity, raising inflationary pressures. But in the longer run, investment adds to the supply capacity of the economy, so putting downward pressure on inflation.

A reduction in Bank Rate lowers the cost of finance to businesses and should therefore encourage them to invest more. However, the durability of capital, together with its irreversibility, means that it is long-term, rather than short-term, interest rates that tend to matter. As noted earlier, risk-free long-term real interest rates have fallen to historically low levels in recent years. The buoyancy of equity markets and the compression of risk premia on corporate bonds in the past three years have put additional downward pressure on the cost of finance to businesses. Moreover, the price of capital goods, particularly IT goods such as computers, has been falling relative to the price of other goods and services.(6) Despite all that, business investment growth had been quite subdued since the millennium, at least up until 2006, contributing to the imbalance in the pattern of demand growth that was discussed earlier.

This weakness reflects the fact that other factors are likely to be of more importance than the cost of finance in determining the level of investment; certainly empirical studies suggest that the influence of the cost of capital is relatively weak. Expectations of future profitability are key, and heightened uncertainty about prospects can lead to investment being put on hold, which may have been the case in the early stages of the recovery from the 2001–03 slowdown. Balance sheet considerations may also have been important, particularly for smaller companies who have to rely on the banks for finance rather than internally generated funds. And for companies with limited access to outside funds, the need to cover pension deficits may also have been a factor. Finally, the recent investment weakness could in part reflect the unusually high levels of investment in IT ahead of the millennium, which reduced the need for subsequent investment.

The next decade

In October 2003, the Governor described the previous ten years as the 'nice' — ***n***on-***i***nflationary ***c***onsistently ***e***xpansionary — decade. As noted above, the volatility of output and inflation were unusually low over this period compared to past experience. Some of that is probably down to the effectiveness of the monetary framework, but some is almost certainly the result of the broader macroeconomic

(1) See Hamilton (2003).
(2) See Nickell (2004).
(3) See Large (2004) and Tucker (2003).
(4) See Waldron and Young (2006).
(5) More details are available at: www.bankofengland.co.uk/publications/other/monetary.htm.
(6) See Ellis and Groth (2003).

environment, in particular the beneficial tailwinds from globalisation and the increase in the labour force.

We cannot guarantee that the next ten years will be so 'nice'. Many of the benefits of globalisation have already worked through, and the adverse impact on commodity prices of the development of China and India is now being felt. And the effective labour force is unlikely to grow as rapidly as it has done over the past decade or so. Moreover, some aspects of the global economy look unsustainable, particularly the pattern of global current account imbalances and the low level of real interest rates and risk premia. So the macroeconomic context is likely to be somewhat less benign.

In the face of these uncertainties, the strength of the current monetary policy framework is the flexibility it gives the MPC to adapt its analysis in the light of events and new data, while still maintaining a clear focus on the inflation target and thus anchoring inflation expectations. As a result, the present policy framework should have the capacity to withstand more turbulent times, if and when they materialise.

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Research and analysis

The macroeconomic impact of globalisation: theory and evidence

By Morten Spange of the Bank's Monetary Assessment and Strategy Division and Chris Young of the Bank's International Economic Analysis Division.

The integration into the world economy of labour-abundant economies — such as China, India and Eastern European countries — has had far-reaching effects. This is of interest to policymakers, who need to understand the channels by which globalisation is affecting the macroeconomy. This article uses an economic framework to analyse globalisation. It outlines the impact predicted by an economic model on key macroeconomic variables such as interest rates, wages and relative prices. The article then compares these predictions with the evidence, and finds that although many macroeconomic variables have responded as projected, some — in particular real interest rates and current accounts — have not.

Introduction

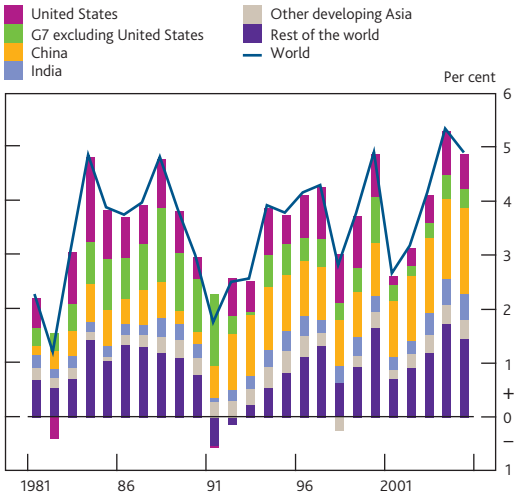
Globalisation is a widely used term. Wolf (2004) surveys the numerous definitions of globalisation, suggesting that it can be characterised as a 'movement in the direction of greater integration, as both natural and manmade barriers to international economic exchange continue to fall'. This definition includes not only the increased international mobility of goods within the world economy, but also the greater mobility of services, capital, labour and financial assets. And it encompasses many of the forces associated with globalisation: the fall in transportation and communication costs; trade liberalisation under the General Agreement on Tariffs and Trade (GATT) and the World Trade Organisation (WTO), including China's accession to the WTO in 2001; and economic and financial market liberalisation in many countries. This article uses the economic theory embodied in a macroeconomic model to examine the likely outcomes of these forces on key macroeconomic variables such as interest rates, wages and relative prices. It then compares these outcomes with the evidence, focusing in particular on the United Kingdom.

Trade between countries — and economic integration more generally — has been increasing intermittently for at least 2,000 years, as Bernanke (2006) documents. But he suggests that the recent phase of economic integration is distinguished from past episodes by its scale: 'The emergence of China, India, and the former communist-bloc countries implies that the greater part of the earth's population is now engaged, at least potentially, in the global economy. There are no historical antecedents for this development'. Grossman and Rossi-Hansberg (2006) note that, rather than countries producing different goods and then trading, as in the past, there is increasingly 'trade in tasks' with the various stages of production of an individual good taking place across a range of countries based on differences in factor costs and expertise.

The integration into the world economy of labour-abundant economies has accelerated since the early 1990s and has already had far-reaching effects — as noted by King (2006), globalisation is 'a process that has transformed supply and demand conditions across the globe'. On the demand side, sustained rapid growth in countries such as China has bolstered global output (**Chart 1**). China has made a significant contribution to global growth over the period since 1980, and since 1990 it has accounted for almost a third of global growth in terms of purchasing power parity (PPP). India has accounted for around 9% of global growth since 1990. Globalisation has also boosted the supply capacity of the world economy, given that a large proportion of the world's potential labour supply is concentrated in these countries (**Chart 2**).

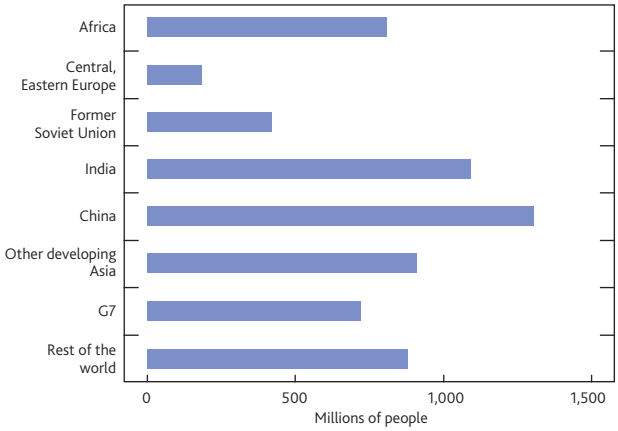
Given its nature, globalisation is likely to affect a number of macroeconomic variables which are important in monetary policy making. As such, policymakers need to understand the channels by which globalisation may have an impact. For instance, Bean (2006) suggests that globalisation may have weakened the short-run trade-off between activity and inflation in three ways: increased trade and specialisation dampens the response of domestic inflation to domestic capacity pressures, and may make it more responsive to capacity pressures in the rest of the world; increased product competition from abroad may limit the extent to which companies can raise prices when domestic demand increases;

Chart 1 Contributions to annual world GDP growth by country/region (PPP weighted), 1981–2005



Source: IMF.

Chart 2 World population in 2005 by country/region



Source: IMF.

and increased potential for off-shoring of production and sourcing of workers from abroad may reduce the degree to which workers are able to bargain for wage increases when the labour market is tight.

How an economic model can be used to analyse globalisation

This section sets out a theoretical building block that can be used to analyse the impact of globalisation on key macroeconomic variables. As economic models typically focus on a limited number of key aspects of the economy, there is no single, all-encompassing model — or indeed theory — that can capture all the potential macroeconomic impacts of globalisation. Nonetheless, an economic model can be a useful starting point when thinking about the impacts of the integration into the world trading system of labour-abundant economies.

A traditional framework for studying trade between different regions of the world is that of Heckscher-Ohlin (HO). This links industrial specialisation and trade to differences between countries in the availability of factors of production such as capital and labour. The HO framework generates a number of propositions. According to the Heckscher-Ohlin proposition, each region will specialise in and export products that use its abundant factor intensively. And the Stolper-Samuelson proposition states that when the relative price of a good falls, the real return to the factor used intensively in its production will fall.(1)

The HO model is a simple model that is silent on dynamic effects, such as the impact on interest rates, current accounts and capital accumulation, as different regions of the world adjust following globalisation. This article explores the issues surrounding globalisation with the aid of a dynamic general equilibrium (DGE) model of the type set out by Benigno and Thoenissen (2003). A DGE model provides a useful framework as it facilitates analysis of the initial impact of globalisation, as well as the subsequent adjustment paths and the long-run equilibrium.

In the model considered here there are two regions, corresponding to the advanced economies, 'West', and the emerging economies, 'East'. Goods are freely traded between West and East. Each region includes both consumers and firms. The consumers maximise utility by deciding on how much to consume and invest, and how much to work; and firms maximise profits. A key feature of the model is that this optimising behaviour by consumers and firms jointly determines output, consumption, wages, interest rates and investment in each region. Although the structure of the model considered here is instructive, it also has limitations. One example is that, as it includes only one type of labour, the impact on unskilled wages relative to skilled wages in each region cannot be studied.

For the purposes of the analysis in this article, an important assumption of the model is that in the initial state of the world, productivity is higher in West than in East. Globalisation is modelled as a one-off, permanent jump in total factor productivity in East. This increase in productivity in East is intended to mimic the transition of a large pool of unskilled labour from relatively low productivity sectors (agriculture) into more productive sectors (industrial production, services), that has occurred in countries such as China and India.

The general equilibrium nature of the model implies that the shock to productivity in the emerging economies has implications for a number of macroeconomic variables in both regions of the world.

(1) See, for example, Feenstra (2004) for details.

How globalisation can affect key macroeconomic variables

This section traces out the likely impact of globalisation on key macroeconomic variables using the model outlined above as the main framework. But, as the model cannot capture all of the impacts of globalisation, it can only be a starting point for the analysis. Given this, the predictions of the model are supplemented by additional economic theory, including the Heckscher-Ohlin and Stolper-Samuelson propositions. The focus is on the effects of globalisation on specialisation and trade; the terms of trade; capital; the current account; labour; and relative prices between raw materials and final goods.

Specialisation and trade

In the initial state of the world, little production takes place in East for sale in global markets. But the productivity increase in East leads to a pickup in global output and an increase in the supply of cheap goods, boosting international trade. The model sketched above does not distinguish between goods and services. But, in order to analyse the effect on goods and services, the Heckscher-Ohlin proposition is useful. This states that each region specialises in and exports products that use its abundant factor intensively. Since East has a relatively large stock of unskilled labour, this suggests that East exports manufactured goods in exchange for West's services, the production of which require a more skilled labour force.

Terms of trade

With an increase in the supply of goods from East, the model suggests that the price of goods produced in East falls relative to those produced in West. Since West is a net exporter of services, this is equivalent to a fall in the price of manufactures produced in East relative to the price of services produced in West. In other words, West experiences an improvement in its terms of trade and East's terms of trade deteriorates. There is also an appreciation of the real exchange rate of West, defined as the price of the consumption basket in West relative to the price of the consumption basket in East. This reflects the fact that goods produced in West have a large weight in West's consumption basket. As the model predicts that goods produced in West have become more expensive relative to goods produced in East, this larger weight on home-produced goods implies that the relative price of West's consumption basket rises.

Capital

In order for East to manufacture goods, investment in plant and machinery is required. In the model, globalisation leads to a rise in investment in East which is driven by the higher returns to capital as a result of the increase in productivity. The model also suggests that investment in West rises slightly. Investing in capital becomes more profitable given the fall in import prices — including of capital goods — from East.

As a consequence of the increased returns to capital, global real interest rates rise. Another way of thinking about this is that the integration of East increases the world economy's effective labour supply. As the world capital stock takes some time to adjust, the world economy's effective capital-labour ratio initially falls. So the return on capital (the real interest rate) increases to restore that ratio. In the long run, as the capital stocks in East and West approach their new and higher levels, real interest rates fall back and eventually return to their initial level. Investment also eases in the long run, but remains above its pre-globalisation level as more gross investment is needed to support the higher capital stock.

Current account

In the model, East has high levels of investment in order to build up its capital stock. As a result, investment exceeds saving, leading to a sustained period in which East runs a current account deficit, matched by West running a current account surplus.

Labour

In the model, the rise in total factor productivity boosts the real wages of workers in East. As globalisation allows consumers in West access to cheap manufactures from abroad, the model suggests that the real consumption wage — workers' take-home pay relative to the retail prices of goods and services — in West also rises. In the model, there is only one type of labour in each country. But in order to analyse the effect on unskilled and skilled labour, the Stolper-Samuelson proposition can be used. This states that when the relative price of a good falls, the relative real return to the factor used intensively in its production, will fall. Increased competition from East reduces the price of labour-intensive goods in West. Therefore, in West real wages paid to unskilled labour fall relative to the real wages paid to skilled labour.

Relative prices between raw materials and final goods

In the economic framework considered in this article, the price of raw materials relative to final goods is not modelled. But simple supply and demand analysis suggests that globalisation is likely to affect the relative prices of raw materials and final goods. The increase in global production associated with globalisation requires additional raw materials and is likely to be associated with rises in the relative price of materials such as oil and metals. Assuming that the supply of raw materials is fairly inelastic, the increase in their demand results in a persistent increase in their relative prices.(1) The price of final goods relative to raw materials is likely to fall as a consequence of globalisation, given that the labour cost of production has decreased. However, it is likely that wages in East — and the relative prices of goods produced there — will

(1) Note that if the rise in demand for raw materials had been perfectly anticipated, their prices would have risen in advance of globalisation rather than following it.

rise towards wages in West in the long term as surplus labour in East is eventually absorbed into the productive sector of the economy and the amount of spare capacity in the economy falls.

It is important to note that such price changes are relative rather than absolute. In the medium to long run, inflation will be determined by monetary policy. Falling prices in some parts of the economy will be offset by rising prices in other parts of the economy. This will happen via a number of channels: as the policymaker adjusts policy to meet the inflation target; as consumers spend the increase in their purchasing power associated with lower prices of imported finished goods on other goods and services; and as companies respond to the higher prices of raw materials by attempting to cut other costs of production. Unless globalisation has altered the nominal target variable for monetary policy, it should not affect the medium to long-term level of inflation. Globalisation may have affected the dynamics of the inflationary process, however, as noted by Bean (2006).

Table A summarises what the theory outlined above implies about the impact of globalisation. It focuses on the initial impact of globalisation and the period over which the economies adjust, rather than on the very long-run effects.

Table A The predicted impact of globalisation on key macroeconomic variables

	East	West
Specialisation and trade	Increase in output, in particular of unskilled labour-intensive final goods	Production shifts to skilled labour-intensive services
Terms of trade	Deteriorate	Improve
Capital	Increase in investment	Slight increase in investment
	Global real interest rates rise	
Current account	Deficit	Surplus
Labour	Real wages rise	Real wages for unskilled labour fall relative to skilled wages
Relative prices between raw materials and final goods	Increase in the relative price of raw materials (oil, metals) Fall in the relative price of final goods	

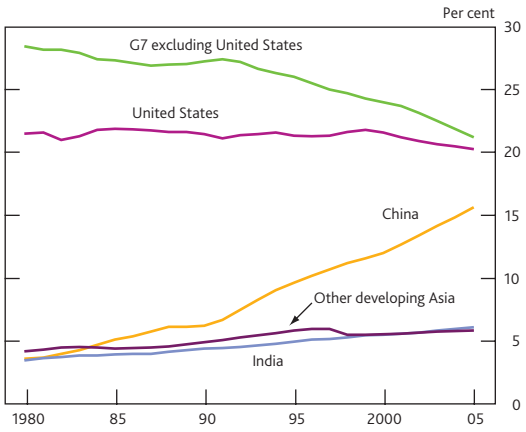
Assessment of the evidence

This section offers a brief overview of the empirical evidence on the variables considered above, noting the extent to which recent economic developments, in particular in the United Kingdom, are consistent with the predictions outlined above and where they differ.

Specialisation and trade

The predicted increase in output in East is consistent with the rapid output growth in China and, to a lesser extent, India and other emerging economies in Asia (**Charts 1** and **3**). Lomax (2006) notes that China is now an important part of global and regional supply chains for the production of low-cost manufactured goods and that it now produces 80% of the world's photocopiers, 50% of the world's textiles and 50% of the world's computers.

Chart 3 Share of annual world GDP (PPP weighted), 1980–2005



Source: IMF.

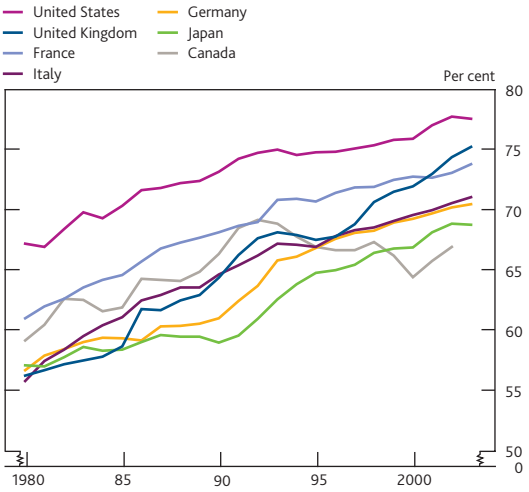
In the G7 countries, the industrial structure has shifted away from manufacturing and towards services, in line with the prediction of a decrease in the share of production that is intensive in unskilled labour in West and an increase in the share of production that is intensive in skilled labour. **Charts 4** and **5** show the changes in the share of services and manufacturing in nominal GDP for the G7 countries since 1980.(1) They suggest that since the early 1990s the United Kingdom's industrial structure has changed by more than the other G7 countries.(2) The sharp fall in the relative size of the UK manufacturing sector partly reflects increased competition from low-cost countries, in common with the other G7 countries. But it also reflects UK-specific factors, such as the appreciation of sterling in the mid-to-late 1990s.(3) Moreover, it is not a recent trend: Besley (2007) notes that the shift of the UK economy from manufacturing towards services has been taking place for more than 50 years.

Terms of trade

The United Kingdom has increased the share of goods it imports from emerging economies since the mid-1990s, and reduced the proportion it imports from the advanced economies (**Chart 6**). Over a similar time period, the United Kingdom has become more specialised in business and financial services, as noted by Besley (2007). The United Kingdom's terms of trade have risen since the late

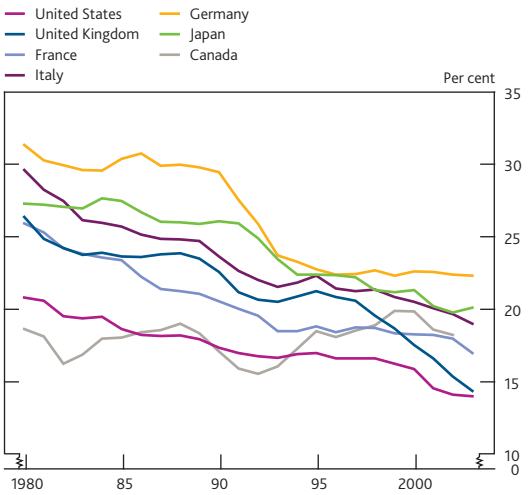
(1) As these shares are nominal, a fall (rise) in the relative price of manufactures (services) will contribute to the fall (rise) in the share of manufactures (services).
(2) To ensure that the shares are comparable across countries, OECD data are used. National data sources show a similar picture.
(3) See for instance Buisán *et al* (2006).

Chart 4 Services nominal share of total GVA, 1980–2003



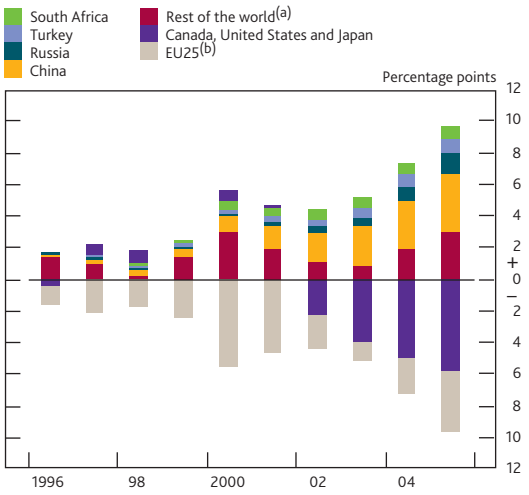
Source: OECD.

Chart 5 Manufacturing nominal share of total GVA, 1980–2003



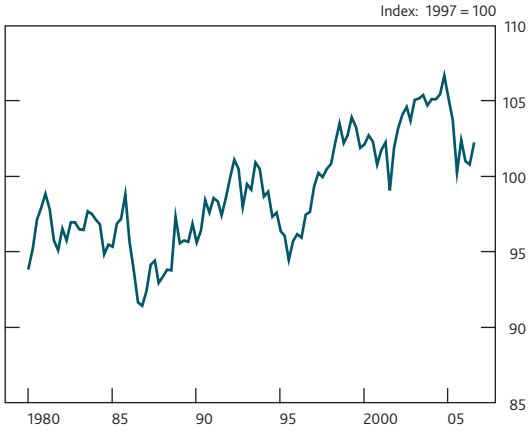
Source: OECD.

Chart 6 Cumulative shift in the share of UK expenditure on imported goods since 1995



(a) Rest of the world is calculated as a residual.
(b) Prior to 1998, data for the EU25 are calculated by adding together imports from the EU15 and the ten Accession countries.

Chart 7 UK terms of trade(a)



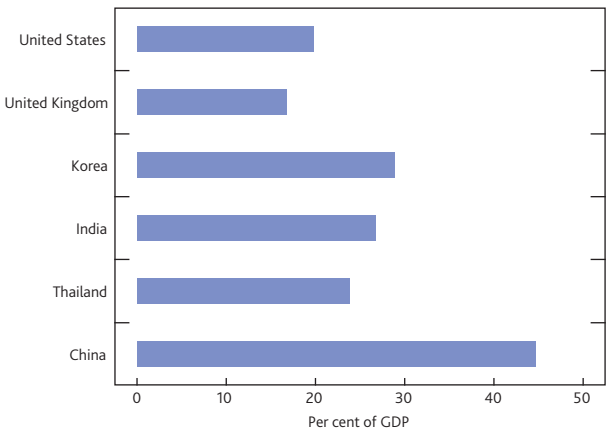
(a) Excluding missing trader intra-community (MTIC) fraud.

1980s, reflecting a rise in the price of exports relative to imports (**Chart 7**). This suggests that the United Kingdom has been able to adapt and to exploit its comparative advantage in the globalised economy. Dury et al (2003) report that the terms of trade for the United States and Germany rose slightly between 1995 and 2002, whereas for some other advanced economies they were flat or fell. Although the model predicts a fall in the terms of trade in the emerging economies, the Chinese terms of trade have been fairly stable since the early 1990s. The World Bank (2006) suggests that this may reflect China expanding the variety and quality of the products it exports. And Grossman and Rossi-Hansberg (2006) note that a wide range of tradable services are being developed in India. As such, while the UK terms of trade have risen as predicted, the evidence for other economies is ambiguous.

Capital

Data for emerging economies can be very uncertain but, according to the available data, investment has grown rapidly in China since the early 1990s, in line with the predictions of the model. The data reports that investment now accounts for 45% of Chinese GDP, up from less than 24% two decades ago.

Chart 8 Fixed investment to GDP ratio at constant prices for selected countries, 2005

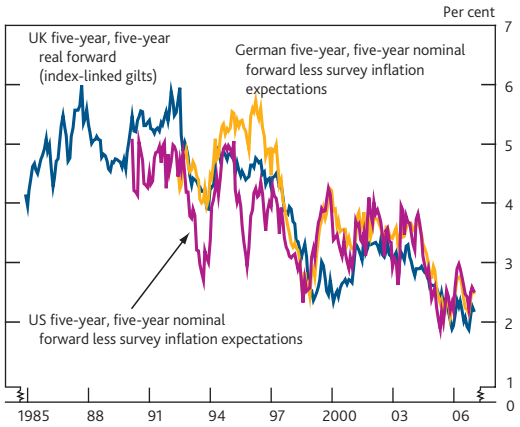


Source: IMF.

This is high in comparison with all of the advanced economies and even other emerging economies (**Chart 8**). In the advanced economies, the change in the industrial structure will have required additional investment in expanding sectors, such as services. But insofar as these sectors are less capital-intensive than manufacturing, the net effect of globalisation may have been to depress business investment in the advanced economies. Gieve (2006) presents data that show that in the United Kingdom some service sectors are more capital-intensive than manufacturing, and in the aggregate, non-manufacturing is slightly more capital-intensive than manufacturing. So the evidence is ambiguous and it is not clear whether globalisation has boosted or depressed investment in the advanced economies.

Real interest rates have fallen since the early 1990s in the United Kingdom, United States and other advanced economies, reaching particularly low levels in recent years (**Chart 9**). This is at odds with the predictions of the model. There are two main candidate explanations, which relate the low level of global real interest rates to the global savings-investment balance. The IMF (2005) emphasise the role of investment, which is low relative to its normal cyclical relationship with growth. They suggest that this reflects companies in many countries using their revenues to repay debt rather than spending on new capital equipment.

Chart 9 Real interest rates in the United Kingdom, United States and Germany

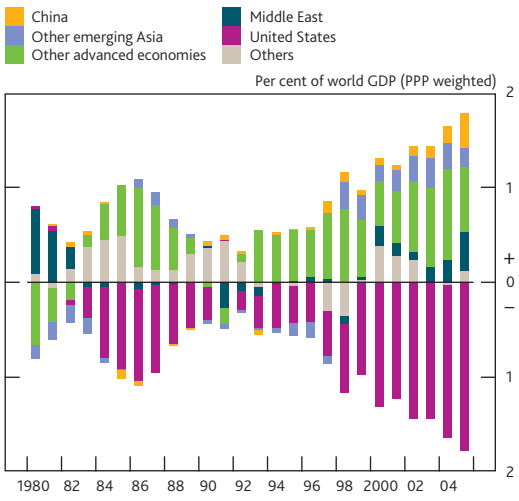


By contrast, Bernanke (2005) suggests that the low level of real interest rates reflects high desired saving. Some of this saving is in the advanced economies, related for instance to the expected increase in the number of retired people relative to workers. But Bernanke suggests that the increase in desired saving over the past decade has been driven by the emerging economies. This reflects a change in their behaviour following the financial crises in emerging markets in the late 1990s, which led emerging economies to accumulate foreign reserves, both to hold as a buffer against potential capital outflows and to prevent exchange rate appreciation to foster export-led growth. Dooley, Folkerts-Landau and Garber (2004) argue that the emphasis of a large number of emerging economies on managing their exchange rates has led implicitly to a revived version of the Bretton Woods system.

Current account

In contrast to the predictions of the model, the developing economies in aggregate have run current account surpluses since the late 1990s (**Chart 10**). This is dominated by China's current account surplus, which has outweighed the impact of India's recent, small current account deficit. The counterpart to this has been an increase in the US current account deficit, with the United Kingdom and Australia also running current account deficits. But there have been large surpluses in most other advanced countries such as Germany and Japan. The Middle East's surpluses have increased in recent years, associated with the rise in oil prices.

Chart 10 Current account imbalances



Source: IMF.

This pattern of current accounts may be explained by factors relating back to savings, specifically to the allocation of savings across assets and markets. Caballero, Farhi and Gourinchas (2006) emphasise the comparative advantage of the US financial system, reflecting strong institutions and good corporate governance. A key feature of their argument is that, by contrast, emerging economies are unable to provide saving instruments that are a good store of value, for example because property rights are not sufficiently well defined. As a consequence, savings are primarily directed into US assets, helping to finance the US current account deficit. Miller and Zhang (2007) present a model in which the emerging economies are highly concerned that their consumption does not fall in the event of a drop in incomes as happened during their financial crises of the late 1990s. This results in high precautionary savings by consumers there which are directed into US assets, associated with a current account deficit in the advanced economies and a current account surplus in the

emerging economies. Such factors may help explain why emerging economies have been lenders rather than borrowers in international capital markets, and why global real interest rates have been low as discussed above.(1)

Labour

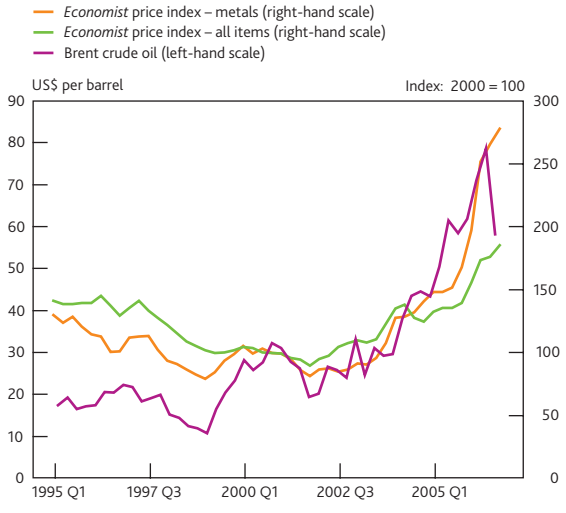
In line with the prediction of the model, wages in the emerging economies have risen. The OECD (2005) finds that since 1980 average incomes in China have increased almost eightfold and urban wages have increased 18-fold, consistent with higher productivity in the manufacturing sector.

In the advanced economies, there is some evidence supporting the prediction of increasing dispersion of wages between skilled and unskilled labour. The OECD (2006) notes that pre-tax earnings inequality within the employed population has generally increased in favour of skilled labour in the OECD countries since 1994. Also the pace of the increase in earnings inequality accelerated relative to the previous decade. But factors other than globalisation may also have led to an increase in wage inequality. For instance, Guscina (2006) suggests that technological change — in particular the IT revolution — may have been biased in favour of those with higher skills.

Relative prices between raw materials and final goods

The predicted increase in the demand for raw materials associated with increased world output is consistent with the rise in the prices of oil, energy and metals in recent years (**Chart 11**). By contrast, UK goods price inflation has been subdued for most of the past ten years, as noted by Bank of England (2007). Pain, Koske and Sollie (2006) attempt to isolate the effect on raw materials prices of demand from the emerging economies. They present a scenario which assumes that since 2000 these economies grew at the same (lower) rate as the advanced economies. Were this to have happened, oil prices would have been up to 40% lower, and metals prices 10% lower, in real terms.

Chart 11 World commodity prices



Source: Thomson Financial Datastream.

As noted above, the relative price changes associated with globalisation should not affect consumer price inflation in the medium to long term, which is determined by monetary policy.

Table B updates **Table A** with the observed outcomes, marked as ✓ for positive evidence, ✗ for negative evidence and ? for ambiguous evidence.

Table B The predicted and actual impact of globalisation on key macroeconomic variables

	East	West
Specialisation and trade	Increase in output ✓, in particular of unskilled labour-intensive final goods ✓	Production shifts to skilled labour-intensive services ✓
Terms of trade	Deteriorate ?	Improve ?
Capital	Increase in investment ✓	Slight increase in investment ?
	Global real interest rates rise ✗	
Current account	Deficit ✗	Surplus ✗
Labour	Real wages rise ✓	Real wages for unskilled labour fall relative to skilled wages ✓
Relative prices between raw materials and final goods	Increase in the relative price of raw materials (oil, metals) ✓ Fall in the relative price of final goods ✓	

Conclusion

The economic theory underlying this article suggests that the integration of China, India, Eastern Europe and other labour-abundant economies into the world trading system is likely to have an impact on a number of key economic variables in the advanced as well as in the emerging economies. As **Table B** shows, much of the empirical evidence thus far seems consistent with the analysis of how globalisation is likely to affect key macroeconomic variables — although it is often hard to isolate the effect of globalisation from other changes in these economies.

There are two key 'puzzles' where the evidence does not match up with the predictions from the theory: the pattern of current account imbalances and the low level of real interest rates. Some of the candidate explanations for these puzzles relate to differences between the advanced and the emerging economies, such as differences in property rights and financial infrastructure, and the emerging economies' desire to accumulate foreign reserves.

(1) See also Lucas (1990) for a review of the possible explanations for capital flows from emerging to advanced economies.

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The macroeconomic impact of international migration

By Richard Barwell of the Bank's Conjunctural Analysis and Projections Division.

Net inflows of migrants have accounted for the majority of UK population growth over the past decade. Migrants who travel to the United Kingdom to work increase the supply of labour to UK companies, and indirectly encourage them to invest in more machinery and equipment, thereby boosting the supply capacity of the economy. Migrants also add to the level of demand in the economy. The issue for monetary policy makers tasked with maintaining control of inflation is how migration affects the balance between demand and supply, and that is likely to depend on the nature of the migrant inflow. Recent migrant inflows appear to have had a slightly larger impact on supply than demand, and may therefore have depressed inflationary pressures in the economy.

Introduction

Every year hundreds of thousands of people migrate into and out of the United Kingdom. The balance between those two gross flows — the net inflow of migrants — is rather smaller. But it has nevertheless accounted for the majority of UK population growth since 1999. This article discusses the likely impact of migrant flows on the UK macroeconomy.(1)

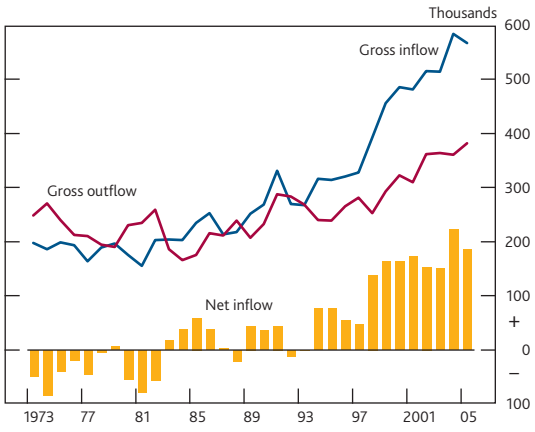
This article begins with a discussion of the estimated size and composition of recent migrant flows into and out of the United Kingdom. These flows are difficult to measure accurately, and the limitations of the various sources of data on international migration are discussed in the box on page 49. The article then reviews the economic reasons why individuals choose to migrate, before discussing the macroeconomic impact of migration. International migration appears to have increased in scale in recent years, perhaps in response to a reduction in the legal or financial barriers to migration. The article ends with a discussion of how increased exposure to migration could have affected the UK economy.

Data on UK migrant flows

A large number of people travel into and out of the United Kingdom each year. But only a fraction of these individuals fall under the ONS definition of a migrant — that is, an individual who changes their country of usual residence for a period of at least a year.(2) Although this official definition is appropriate for measuring the long-run impact of international migration on the population of the United Kingdom, it may be too restrictive when thinking about the economic impact of migration. Large numbers of individuals enter the country to study or to work for a period of weeks or months. These 'visitors' will not be captured in the official migration statistics, but they may contribute to the level of demand and supply.(3)

The official data suggest that the net inflow of migrants has increased over the recent past. There was a net inflow of 185,000 migrants into the United Kingdom in 2005 (the latest full year for which data are available), and in the preceding

Chart 1 Migrant flows into and out of the UK population(a)



(a) Data before 1991 do not include migrant flows between the United Kingdom and the Republic of Ireland, or flows of asylum seekers and their dependents, and have not been adjusted to account for inaccuracies in the IPS data on intended duration of stay.

(1) A box on page 24 of the November 2006 *Inflation Report* also discusses the macroeconomic impact of migration. For more details on the economic characteristics of migrants see Saleheen and Shadforth (2006).
(2) This definition is consistent with the United Nations Organisation's definition of a long-term migrant; that is: 'A person who moves to a country other than that of his or her usual residence for a period of at least a year (twelve months), so that the country of destination effectively becomes his or her new country of usual residence'. See United Nations (1998) for more details.
(3) These individuals will be recorded in the data collected by the Civil Aviation Authority, the Department for Transport, and Eurotunnel and Eurostar are discussed in the ONS' monthly 'Overseas travel and tourism' First Release.

Data on international migration

The ONS receive information on the total number of people who enter and exit the United Kingdom each year via airports or sea ports and the Channel Tunnel from the Civil Aviation Authority (CAA), the Department for Transport (Dft) and Eurotunnel and Eurostar respectively. The ONS use the International Passenger Survey (IPS) to estimate the fraction of the overall traffic of people into and out of the country that reflects migrant flows. The IPS is a survey of one in every five hundred individuals who enter and leave the country through the main UK air and sea ports and the Channel Tunnel.(1) Official estimates of the total number of migrants who enter and exit the United Kingdom each year are therefore based on two data sources: information from the CAA, DfT and Eurotunnel and Eurostar on the gross flows of people into and out of the country, and IPS estimates of the fraction of those flows that are migrants.(2)

There are a number of sources of uncertainty around these official estimates of the number of migrants entering and exiting the country, and they primarily relate to the role played by the IPS in the construction of the data. One source of uncertainty lies in the fact that the sample of people who are interviewed for the IPS may not be representative of the population of travellers. If the survey sample is not representative then the IPS cannot be relied upon to give a reliable estimate of the proportion of those travellers who are migrants. The sample may not be representative on account of sampling error — the sample is chosen at random, so it cannot be expected to reflect the underlying population of travellers perfectly.(3) Another reason why the IPS sample may not be representative lies in the voluntary nature of the survey. Around one in five travellers who are asked to participate refuse to do so. Unless migrants and visitors are equally likely to refuse to participate in the survey, the IPS sample will provide unreliable estimates of the migrant share of the overall population of travellers.

Another IPS-based source of uncertainty around the official migration reflects the fact that the survey respondents cannot be relied upon always to give accurate information. Individuals are identified as migrants only if they report that they intend to stay in the country for over a year. If people's intentions are not a reasonable guide to their actual duration of stay these estimates may not accurately reflect the true migrant flows.(4)

There are a range of other data sources which provide additional information on the size of the gross inflow of immigrants into the United Kingdom, such as the number of: Work Permits issued by the Home Office, applications for National Insurance numbers or registrations at GP surgeries. The advantage of these administrative data sources is their accuracy, because they tend to have near 100% coverage of the subset of the population they are trying to measure. But they cannot be used to corroborate official estimates of the net inflow of migrants because they do not provide any information about the gross outflow of emigrants.

Information collected under the Worker Registration Scheme (WRS) is an example of this kind of administrative data source. The WRS has tracked the number of nationals from eight of the former Accession countries who have found work in the United Kingdom since 1 May 2004.(5) These data provide timely estimates of the number of migrants from these countries who have found work. But it is difficult to draw direct conclusions about the gross inflow of migrants from these countries because the data only cover people who have found work, and because some of these individuals may have already been in the country before 1 May 2004 or may have subsequently returned home.

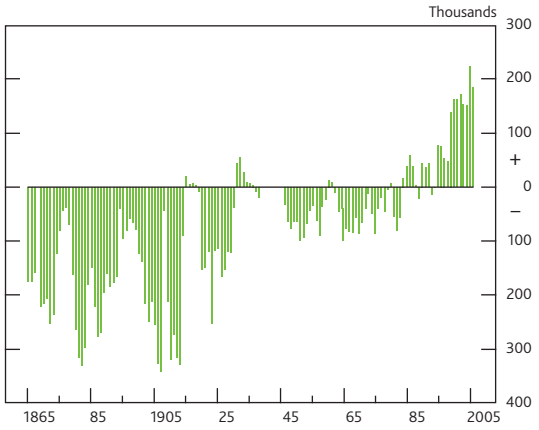
Surveys of the household population — like the Labour Force Survey (LFS) — can provide more detailed information on the characteristics of immigrants. However, these data cannot be used to corroborate the official estimates of the size of the immigrant population. Estimates of the migrant share of the population based on the LFS are subject to the same uncertainties that affect the IPS: the LFS sample may not be representative due to sampling error and non-response bias, and the information households provide may not be accurate. And even if the LFS could provide a reliable estimate of the number of migrants in any given survey sample, that information is not sufficient to measure the number of migrants living in the United Kingdom more accurately because there is also uncertainty around the size of the total household population.(6)

One key disadvantage of many of these data sources is that they are published with a significant time lag. And that is why the intelligence gathered by the Bank's regional Agents on the impact of migration is particularly valuable. The Agents' contacts have consistently reported that migrants have helped ease labour shortages (see Bank of England (2005, 2006)).

(1) Around one in ten people who travel into or out of the United Kingdom are not covered by the survey, because interviewing is suspended at night or because their particular route is not covered.
(2) The ONS supplement these data with estimates of the inflow of asylum seekers and their dependents, and the flow of migrants between the United Kingdom and the Republic of Ireland.
(3) The scale of this uncertainty around the total migrant flows can be gauged from the estimated confidence interval around the official estimates. The ONS estimate that 518,100 people migrated into the United Kingdom in 2004. But they also estimate that there is a one in twenty chance that the actual inflow was either less than 479,300 or greater than 556,900 — or, in other words, the inflow could have been up to 7.5% lower or higher.
(4) The ONS try to correct the raw IPS data to account for these sorts of problems. See ONS (2006), *International migration (MN Series)*, Issue 31.
(5) The WRS covers nationals from the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.
(6) The benefits and limitations of these data are described in more detail in Saleheen and Shadforth (2006).

year, the net inflow was 223,000. Those net inflows were large, by historical standards (**Chart 1**). Between 1998 and 2003 the net migrant inflow averaged around 150,000 people a year, and there was a net outflow of migrants from the United Kingdom as recently as 1993. And before the Second World War the gross flow of migrants out of the United Kingdom was almost always larger than the gross inflow (**Chart 2**). Migration to the United States accounted for a large part of that net outflow.

Chart 2 Estimated annual net migration to the United Kingdom[a]



Sources: *Board of Trade Journal*, Ferenczi and Willcox (1929), Mitchell (1988) and ONS.

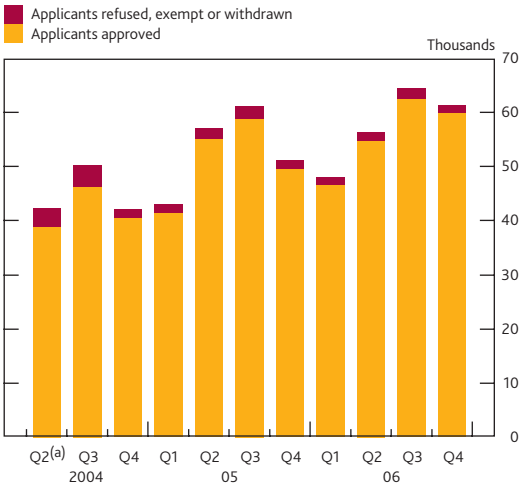
(a) Data from 1855–1924 in *International Migrations*, Vol. 1, 1929, edited by Willcox, W F (with introduction by Ferenczi, I), New York, National Bureau of Economic Research; data from 1925–64 in *Board of Trade Journal*, © Crown Copyright 2007. Both cited in Mitchell, B R (1988), *British historical statistics*, Cambridge University Press, pages 77–80.

The pickup in the net inflow of migrants in 2004 and 2005 was driven in part by the enlargement of the European Union. Since 1 May 2004 nationals from eight countries in Central and Eastern Europe have gained the right to live and work in the United Kingdom. Administrative data from the Worker Registration Scheme (WRS) indicate that several hundred thousand individuals from these countries have found work in the United Kingdom since enlargement (**Chart 3**).

Net inflows of migrants have accounted for the majority of UK population growth over the past decade and will continue to do so in the near future according to the latest set of ONS population projections (**Chart 4**).(1) And in terms of the stock, inflows of overseas residents (and net outflows of British residents) have also raised the fraction of the UK population that was born abroad (**Chart 5**).

The official migration data also provide information on the economic characteristics of the net migrant inflow.(2) Migrants are predominantly young people, and almost exclusively of working age (**Chart 6a**). The most frequently cited reason for migration was to study (**Chart 6b**). Although large numbers of people report migrating into the United Kingdom for 'work-related' reasons, these migrants account for little of the net migrant inflow.(3)

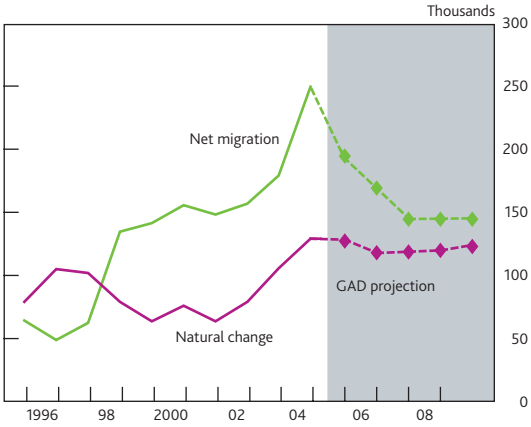
Chart 3 Applicants from eight of the Accession countries, by quarter applied



Source: *Accession Monitoring Report*.

(a) Data for May and June 2004 only.

Chart 4 Source of UK population growth: past, present and future[a]



Sources: Government Actuaries Department (GAD)/ONS and Bank calculations.

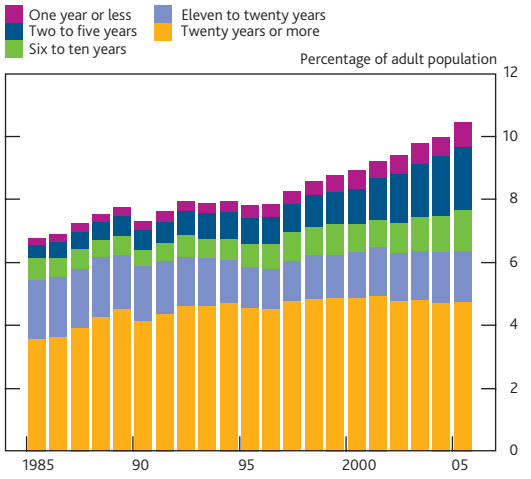
(a) These data refer to growth in the overall population. For a comparable chart documenting the sources of growth in the adult population see **Chart 2** on page 61 of Barwell *et al* (2007).

Why do people migrate?

Migration is not costless. Migrants face the direct costs of travel and relocation of property. And they may not start working as soon as they arrive in a new country, so the costs of migration also include the foregone income that they could have earned during that time if they had been working in their home country. There may also be social costs arising from the loss of contact with family, friends and the local community.

(1) More youths have become adults than children have been born over the recent past so the pace of natural change has been larger for the adult population than for the population as a whole. Migration therefore accounts for a correspondingly smaller share of growth in the adult population.
(2) Saleheen and Shadforth (2006) examine the characteristics of immigrants in more detail.
(3) Only those individuals who have a definite job to go to are classified as migrating for 'work-related' reasons; those coming to look for work are classified as 'other'. For information on the breakdown of the total inflow of migrants see Saleheen and Shadforth (2006).

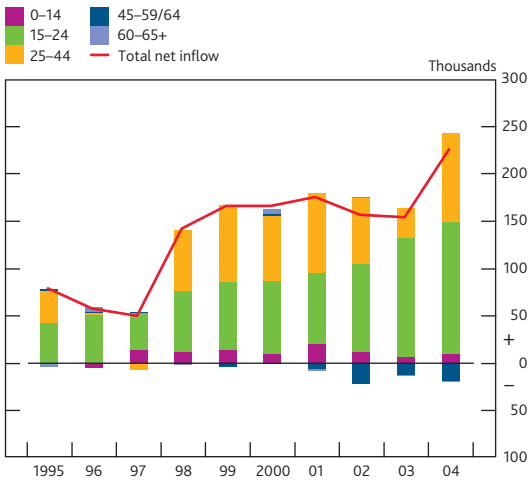
Chart 5 The foreign-born share of the adult population, by time of arrival



Source: Labour Force Survey (LFS) microdata.

Chart 6 Decomposing the UK net migrant inflow

(a) By age group



(b) By main reason for migration

When people choose to migrate they will tend to weigh these costs against the potential benefits. Those benefits may not be financial: individuals may migrate to be reunited with family members; to study; to experience foreign cultures; or to flee persecution. This article focuses on the economic rationale for migration: the opportunity to achieve a higher standard of living by earning a higher real wage or having a better chance of finding work (see Hicks (1932)). These benefits are often uncertain: migrants may not know for sure how much they will earn in the host country. So if people are risk-averse — that is, if they value the relative certainty of their current earnings — then people may not choose to migrate if they believe the benefits from migration are only marginally higher than the costs.(1)

An economic decision to migrate will reflect a comparison of perceived living standards in the host and source countries. In the case of migrants from developing countries, the motivating factor is more likely to be the higher level of UK real wages. In the case of migrants from countries with a standard of living similar to the United Kingdom's such as the United States or most members of the European Union, the motivating factor is more likely to be cyclical movements in wages and the probability of finding work. Understanding which of these forces motivated people to migrate to the United Kingdom is important because it sheds light on the amount of time these individuals are likely to remain in the country. Migrants motivated by cyclical differences in living standards may be less likely to remain indefinitely. And, as this article will go on to explore, the amount of time migrants plan to remain in this country shapes the impact of a given migrant inflow on the balance between demand and supply in the UK economy.

The macroeconomic consequences of migration

A net inflow of migrants will affect the level of both aggregate demand and supply in the economy. What matters for monetary policy makers focused on controlling inflation is the scale and speed of the stimulus to demand and supply that migration generates, because that determines whether migration increases or reduces inflationary pressures in the economy.

Migration and aggregate supply

The supply capacity of the economy depends on the amount of labour and capital employed by companies and the efficiency with which companies can combine that labour and capital to produce output. In theory, an inflow of migrants could affect all three of these.

(1) Even large and persistent expected differences in living standards across countries do not guarantee flows of workers, as many countries impose restrictions on the number of immigrants that they accept.

Migration and labour supply

What matters to companies is how easily job seekers can fill vacancies — so the supply of labour to companies will depend on whether and how effectively each individual searches for work, as well as how many people are looking for work. The aggregate supply of labour to companies will therefore reflect the total size of the UK population, the incentives for each individual to search for work, and the effectiveness of that searching.

An individual's decision over how many hours they are willing to work each week (if any) will depend on a range of factors (Pencavel (1986)). People work to earn money to pay for consumption, so their labour supply decision will reflect both the wage they can earn and the other resources they have at their disposal to fund consumption. An individual's post-tax hourly wage determines the amount of consumption that each hour of work can provide and will depend in large part on their characteristics, such as their qualifications and their physical health. The higher the wage an individual can earn, the more likely they are to want to work. But if individuals can fund significant consumption out of wealth or non-labour income then they may be less likely to want to work. Labour supply decisions will also reflect individuals' preferences over consumption and leisure — that is, how much consumption they are willing to sacrifice for an extra hour of leisure. Those preferences will also vary according to people's characteristics, for example whether they have to care for members of their family.

The effectiveness with which people search for work is also likely to depend on their characteristics. In order to be able to search effectively for work, people need to be able to access and identify relevant vacancies and they also need to be attractive to potential employers when they apply for jobs. So search effectiveness will depend on the knowledge, skills and characteristics that individuals possess.

A net inflow of migrants will therefore affect labour supply in two key ways. First, it will increase the size of the population and therefore boost the aggregate supply of labour to companies. Second, migrants may have a further impact on labour supply if they differ from the average UK resident in terms of their job search behaviour — that is whether and how effectively they search for work, or the number of hours they want to work.

Migration and job search

Migrants search may differ from the average UK resident on account of differences in the characteristics of these two groups. Employment rates tend to vary systematically by age (Barwell (2000)); in particular, people are less likely to search for work once they reach retirement age. So recent inflows of migrants could have further boosted aggregate labour supply because a far larger share of the migrant inflow is of working age compared with the current UK population. But some migrants may have a limited grasp of English when they first arrive and that may limit their ability to search effectively for jobs in the short run.

Job search among migrants and UK residents may also differ on account of differences in the circumstances these two groups face. Migrants may not be entitled to the same level of government benefits as UK citizens. And they may not have access to credit on the same terms as UK residents. Without these alternative means of funding consumption, migrants may be more likely to search intensively for work.

The reason why individuals chose to migrate to the United Kingdom may also shed light on their search effectiveness. People who have paid the costs of migration to have the opportunity to earn higher wages are likely to search intensively for jobs. According to data from the IPS, large numbers of migrants report entering the United Kingdom to study, which could imply that a relatively small proportion of the inflow will actively search for work. But a considerable proportion of the current (adult) student population are also employed, and it is unclear why foreign students would behave differently.

Migrants may not search effectively for jobs when they first arrive in the United Kingdom, on account of their inexperience in the UK labour market.(1) Some migrants will have already arranged a job when they arrive in the country, but many will have to start looking for work once they have arrived. New migrants will have to learn where new vacancies are advertised and how to identify suitable openings from the large stock of available vacancies.(2) But migrants' knowledge of the UK labour market will improve over time, helping them to search more effectively for work.

Data from the Labour Force Survey (LFS) suggest that migrants are more likely to be employed than not, but on average, are less likely to be employed than those who were born in this country (see the annex of this article for more details). That may reflect the fact that a relative large proportion of migrants are in full-time education or caring for family members (**Chart 6b**). But the majority of these individuals arrived in this country many years ago (**Chart 5**), and they are less representative of more recent migrants. To

(1) Frijters *et al* (2005), report evidence that is broadly consistent with this hypothesis. They find that 'immigrant job search appears to be less effective than that of equivalent UK born job seekers'. In particular, differences in the probability of these two groups being able to find work cannot be explained by differences in the method those groups use to search for work. The authors also find evidence that migrants may become more effective at searching for work the longer they have been in the country.

(2) This process of job search may also involve a period of trial and error. Migrants may have to sample a number of jobs — accepting a job offer and then quitting when it proves a bad match — before they happen upon a vacancy which suits their particular characteristics. This process of job-shopping is one explanation why new entrants to the labour market (like youths and in principle migrants too) might suffer relatively high unemployment rates (Johnson (1978)).

the extent that recent inflows have contained large numbers of working-age adults who have come to this country to work, then they could have had a larger impact on UK labour supply. Saleheen and Shadforth (2006) discuss this in more detail.

Migration and desired working hours

Migration could have boosted the supply of labour to UK companies by affecting the average number of hours individuals are willing to work, as well as the total number of people searching for work. Workers will tend to respond to a temporary increase in their wage by working longer hours, because that allows the possibility of working shorter hours over the rest of their working life and enjoying more consumption. Migrants who relocate to a high-wage economy like the United Kingdom may work relatively long hours while they remain in the country. Migrants may also prefer a different balance between work and leisure than a typical UK resident, if they use part of their income to support family and friends abroad who may have a lower standard of living. LFS data are consistent with these hypotheses: when they are employed, migrants do appear to work longer hours than individuals who were born in this country (see the annex for details).

The supply capacity of the economy depends on the quality as well as the quantity of labour employed by companies.(1) If the workforce becomes more productive then that should lead to an increase in output. Labour quality is not directly measurable but can be indirectly proxied by the average level of educational attainment of the workforce. There is mixed evidence on whether immigrants tend to be better or less educated on average than individuals born in this country.(2) But the impact of a net inflow of migrants on overall labour quality in the United Kingdom also depends on the qualifications of emigrants, about which very little is known, so it is very difficult to know whether migration has affected UK labour quality, and in which direction. It is also possible that any impact of migration on labour quality may vary over time. In the short run, migrants may not be fluent in English and may have difficulties in searching effectively for vacancies. So migrants' qualifications may overstate their contribution to the quality of the workforce in the short run.

Migration and the capital stock

A net inflow of migrants will tend to increase the size of both the population and the workforce. Both of these factors will tend to raise the value that companies attach to new capital goods. A larger population will demand a larger volume of goods and services, which will indirectly boost companies' demand for capital and labour. And a larger workforce will tend to raise the amount of output that can be produced from an additional unit of capital, further boosting businesses' demand for capital goods. So a net inflow of migrants should raise companies' expectations of the stream of revenue that a new capital good can generate and that should stimulate spending on capital goods in the long run; although that higher investment may take some time to materialise. So an inflow of migrants should eventually lead to an increase in the size of the capital stock and therefore the supply capacity of the economy. Past episodes of mass immigration have certainly coincided with periods of rapid capital accumulation.(3) What is less clear is the timing and scale of the increase in investment.

It is unlikely that companies will begin to invest as soon as migrants arrive in the United Kingdom. Increased spending on new capital goods is likely to be funded out of the higher profits that companies may earn if the net inflow of migrants temporarily depresses wages. And wages are unlikely to fall as soon as migrants arrive because migrants will only gradually boost labour supply. Moreover, companies are unlikely to respond immediately to an increase in their profits. There are sunk costs in investment: companies cannot recoup the full costs of unprofitable capital goods, so they will tend to delay spending on capital goods if they are uncertain about the potential returns from investment. So there could be a significant delay between the arrival of migrants and expenditure on new capital goods by UK companies.

The extent of the increase in the capital stock may hinge on the characteristics of the migrant inflow. Highly skilled workers are likely to be able to produce more output from complex machinery than those with relatively few skills. Companies' investment decisions may therefore be affected by the balance between skilled and unskilled workers in their local labour market. So a net inflow of migrants can therefore affect the incentives for companies to introduce new capital-intensive technologies if migration affects the skills mix of the UK population (Lewis (2005)).

Migration and technology

Technical progress captures improvements in the efficiency with which capital and labour are combined to produce output. An inflow of migrants could encourage technical progress, but the extent of any improvement will depend heavily on the composition of the migrant inflow. The rate of technical progress depends in part on the amount of resources devoted to Research and Development (R&D). So migration could encourage technical progress if the inflow contains

(1) Changes in the skill mix of the workforce could also have implications for the quantity produced and (relative) price of different goods and services. These issues are beyond the scope of this article; for more details see Rybczynski (1955).
(2) For more details on the qualifications of migrants relative to people born in this country see Dustmann, Fabbri and Preston (2005) and Saleheen and Shadforth (2006).
(3) Most of the empirical analysis of the impact of mass migration on the capital stock has focused on the Israeli economy. Cohen and Hsieh (2000) report that the absorption of over 710,000 Soviet Jews into the Israeli economy in the early 1990s (which boosted the working-age population by 15%) led to a sharp increase in the rate of return on capital and a sustained increase in investment in machinery and equipment. See Ben-Porath (1997) for a discussion of similar periods of rapid capital accumulation in response to earlier waves of immigrants into Israel.

highly skilled individuals who are capable of innovative work in the R&D sector.(1) Migration could have a more direct impact on technical progress if migrants bring valuable knowledge with them about production techniques overseas, which could improve the efficiency with which UK companies combine capital and labour.

Migration and aggregate demand

An inflow of migrants will boost the level of demand, as well as supply. The previous section discussed how an inflow of migrants can lead to an increase in the size of the capital stock. And as companies purchase those additional capital goods they will boost aggregate demand. This section explores how migration affects another key component of demand: consumption.(2)

Migration and consumption

An inflow of migrants will boost the level of consumer spending. Migrants will have to consume essential goods and services like food and accommodation, and that will add to the overall level of spending in the economy.(3) UK households spend money on a wide range of other consumer goods and services, as well as on these essentials. The impact of a net inflow of migrants on the level of consumption will therefore hinge on the extent to which migrants spend money on these non-essentials, over and above that spent on essentials.

One reason why migrants might significantly boost consumer spending is their potential desire to build up their stock of durable goods rapidly. Durable goods such as furniture, clothing and white goods provide households with a flow of services that they consume over a long period of time (see Hamilton and Morris (2002)). Migrants are unlikely to bring many durable goods with them, so they may want to build up their stock of these goods quite rapidly.(4) Migrants tend to be relatively young so they can expect to enjoy the flow of services that durable goods provide over a long period of time, and that is also likely to boost their demand for these goods.

But there are also reasons to suspect that migrants might spend rather less than UK residents. Migrants may plan to return home at some point in the future, so they may save a large fraction of their income to allow greater consumption when they return home (where the cost of living may be lower). And many migrants send part of their income back home to support family and friends: that should further reduce migrants' spending in this country.(5)

Migrants' spending behaviour is likely to hinge on how long they expect to remain in the country, and the level of prices and wages in the United Kingdom relative to that in their home country. People tend to smooth their consumption — that is, they save money when their earnings are temporarily strong, and run down savings when their earnings are temporarily weak. Those migrants who can earn higher wages in this country but do not intend to remain for a long period of time are likely to save a relatively large fraction of their income.(6) But if migrants plan to stay until they retire, and then return to their country of birth, they may save a relatively small fraction of their income. These migrants will face a relatively lower cost of living in retirement so they may need to build up a smaller stock of savings than those workers who intend to remain in the United Kingdom. The spending behaviour of German immigrants suggests that migrants are more likely to save income if they plan to return home (Merkle and Zimmermann (1992)).

Consumption by UK households could also be affected in the short run by an inflow of migrants. An inflow of migrants will tend to put upward pressure on house prices, given that the UK housing supply is largely fixed in the short run. An increase in house prices generates housing equity for homeowners, which they can use as collateral to borrow funds at a relatively low interest rate. Consumption could temporarily rise if that increase in housing equity leads to an increase in borrowing, or if the opportunity to borrow at a cheap rate leads homeowners to save a smaller fraction of their income.(7)

Migration and the balance between demand and supply

The above analysis suggests that an inflow of migrants will boost the levels of both aggregate demand and aggregate supply. Likewise, an outflow of emigrants will reduce both demand and supply. The key issue for monetary policy makers focused on controlling inflation is how the net flow affects the balance between demand and supply — that is, whether it adds to inflationary pressure in the economy.

There is little academic research which can shed light on this issue. Most of the research that has been done has analysed how migration affects outcomes in the labour market, such as

(1) There is evidence that highly skilled migrants can encourage technical progress. Zucker, Darby and Brewer (1998) document the important role played by what they call 'star scientists' in driving growth in the American biotechnology industry. Stephan and Levin (2001) find that a disproportionately large share of those individuals who have made exceptional contributions to science and engineering in the United States were migrants.
(2) A net inflow of migrants could also affect the other components of demand. Migration could affect the pattern of government spending (see Gott and Johnston (2002)). And it is even possible that a net inflow of migrants could affect the demand for UK exports. For example, the exchange rate may respond to any increase in the flow of income that migrants send abroad (see Amuedo-Dorantes and Pozo (1994) for evidence of how these flows can affect the exchange rates of the source country).
(3) These expenditures do not rely on migrants having found work. Spending may be funded out of wealth that migrants bring with them or via credit arrangements.
(4) In some cases the alternative to purchasing durable goods — that is, purchasing the flow of services that durable goods provide — is expensive (for example, eating out a restaurant rather than cooking food at home), and in others no genuine alternative exists (for example, clothing).
(5) According to the United Kingdom's Balance of Payments ('*The Pink Book*') the annual flow of migrant remittances amounts to several billion pounds.
(6) These migrants will also not want to spend large sums of money building up a stock of durable goods that will be difficult to sell when they leave the country.
(7) See Benito *et al* (2006).

the path of nominal wages or the unemployment rate.(1) The majority of that literature has focused on the microeconomic impact of migration — that is, whether inflows of migrants affect the wages and probability of finding work of residents with similar characteristics — rather than the impact on aggregate wages or unemployment.(2) And the academic research that has concentrated on the macroeconomic impact of migration has largely focused on the Israeli economy which has experienced several episodes of mass immigration.(3) But it is unclear what lessons can be drawn from those episodes given the unique circumstances in which the migrant flows took place.

The net inflow of migrants into the United Kingdom has increased over recent years (**Chart 1**). This article has outlined two key factors which are likely to have played a key role in determining how that higher migrant inflow has affected the balance between aggregate supply and demand. First, the characteristics of the migrant inflow, which determine both the absolute size of the impact of migration on the supply capacity of UK companies and the speed with which it affects capacity. Second, how long migrants expect to remain in the country which shapes their decision to spend or save income and perhaps the scale of any increase in investment by UK companies.

Data from the WRS testify to the speed with which recent migrants have entered the labour market. Reports from the Bank's regional Agents paint a similar picture. Recent migrant inflows appear to have had a significant impact on UK labour supply. There is also some evidence that migrants have helped to ease recruitment difficulties, allowing companies to expand employment without having to bid up wages (see King (2004)).(4)

Data from the International Passenger Survey indicate that the majority of migrants intend to stay in the country for a relatively short period of time (**Chart 7**). If the majority of migrants do intend to return home in the near future, it is likely that they will try to save a large fraction of their income. So recent inflows may have had only a muted impact on aggregate demand.

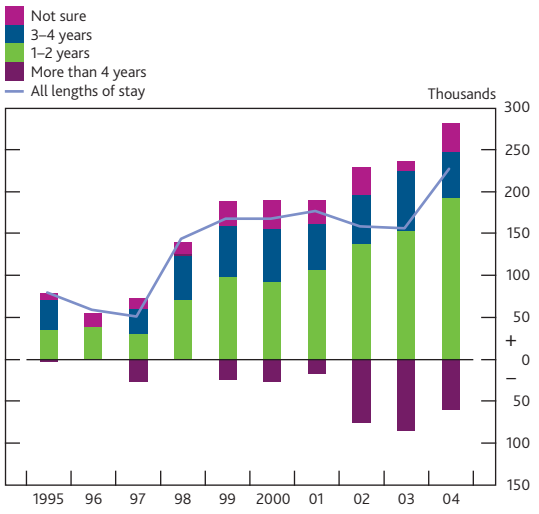
On balance, recent inflows of migrants have probably had a larger impact on aggregate supply than demand (see November 2006 *Inflation Report*). So migration has probably helped to ease inflationary pressures in the economy, at least temporarily.

The impact of a decline in the barriers to migration

The official data suggest that there has been a pickup in the gross flows of migrants into and out of the United Kingdom in recent years. The United Kingdom's experience does not appear to be unique (OECD (2006)): there appears to have been a global increase in the scale of cross-border migration. That might reflect a decline in the direct costs of travel, the removal of legal restrictions on migration or the growth of employment agencies which source UK companies with foreign labour.(5) This section of the article discusses the likely impact on the UK economy of a reduction in the barriers to migration.

If the barriers to migration have fallen, then changes in UK wages will tend to generate larger flows of migrants into and out of the country. Companies will find it easier to vary the size of their workforce in response to changes in demand without having to make large adjustments to their wage rates. That makes production costs less sensitive to the level of activity, and as a result, companies will have less incentive to change their prices in response to temporary shifts in demand. So at the aggregate level, movements in output around its sustainable level will generate less pressures on prices, though inflation will continue to be determined by monetary policy in the medium term. In other words, a reduction in the barriers to migration will tend to flatten the structural trade-off between output and inflation, the short-run Phillips curve.

Chart 7 Intended length of stay in the country



(1) The labour market is not an ideal prism through which monetary policy makers can study the macroeconomic impact of migration. Outcomes in the labour market do not determine the path of output or inflation. If migration provides a sufficiently large boost to demand then companies may raise prices even if the outward shift in labour supply depresses wages as companies expand their profit margins. Alternatively, if migration provides little or no stimulus to demand, then output may fall even if employment increases as companies hire more workers at the lower wage.
(2) The literature has not arrived at a settled view on this question; see Borjas (2003) and Card (2005) for recent expositions of both sides of this debate.
(3) See Ben-Porath (1997), Eckstein and Weiss (2002), Hercowitz and Yashiv (2002) and the references therein.
(4) If migrants have helped to ease recruitment difficulties because they have particular skills or live in particular regions where the demand for labour is strong then they may have had a disproportionate impact on wage pressure. See Layard, Nickell and Jackman (1991) for more details on the importance of the mismatch between the demand and supply of labour in explaining wage pressure.
(5) These employment agencies reduce the uncertainty that individuals face about their income if they migrate to the United Kingdom because they provide migrants with a job guarantee. Reducing that uncertainty should encourage a larger flow of migrants if people are risk-averse.

The concept of a sustainable level of output begins to lose meaning if all barriers to migration disappear and there is a plentiful supply of potential migrants overseas. Any level of output may become sustainable if companies can vary the size of the workforce without any impact on their production costs. But companies need capital as well as labour to produce output and they cannot rapidly change the size of their capital stock in response to shifts in demand. Companies will need more and more workers to produce an extra unit of output if their capital stock is fixed, and as a result, production costs will rise even if companies can employ as much labour as they want at a given wage.(1)

A decline in the barriers to migration could also have an impact on the UK economy without any actual change in migrant flows. The possibility of migrant inflows means that UK workers know that their employers will find it easier to replace them, and that may restrain their wage demands. In other words, a reduction in the barriers to entry (and exit) could make the UK labour market more 'contestable'.(2)

This discussion assumes that there is an ample supply of workers overseas ready to migrate to the United Kingdom. That potential supply of migrant labour could eventually dwindle if the gap between living standards in the United Kingdom and the developing world narrows, or if the cyclical position of the UK economy deteriorates relative to its major trading partners. That could have implications for UK wages and prices. So a reduction in the barriers to migration makes the UK economy more sensitive to developments elsewhere in the world.

Conclusions

Net inflows of migrants can account for the majority of UK population growth in recent years. Migration affects the levels of both aggregate demand and supply. The issue for monetary policy makers is how migration affects the balance between them — that is, whether migrants stimulate or ease inflationary pressures in the economy. That depends, in part, on the nature of the migrant inflow. The speed with which migrants boost supply will reflect their characteristics and their motivation for travelling to this country. The speed with which that increase in labour supply transmits itself into wages and profits will affect the timing of any pickup in investment. How long migrants are expected to remain in the country will shape their decision to spend or save, and perhaps UK companies' decisions to invest in capital. How migration affects the balance between aggregate demand and supply is therefore ambiguous in theory. But in practice, recent migrant inflows have probably had a slightly larger impact on aggregate supply than demand, helping to ease inflationary pressures for a period in the UK economy as a whole.

(1) In the long run the fixed supply of land is likely to impinge on production costs. That is, rental costs are likely to rise as companies expand the scale of production even if companies can costlessly increase the amount of capital and labour they use to produce output.
(2) See Baumol (1982) for a discussion of the theory of contestable markets in its original context — that is, the product market.

Annex
Comparing the labour market performance of migrants and individuals born in the United Kingdom

This Annex describes the results of some regression analysis of the labour market performance of migrants, relative to individuals born in the United Kingdom.(1) Regression analysis is a technique which can be used to quantify how the expected value of some variable of interest, such as the number of hours an individual works, depends on a set of explanatory variables, such as whether that individual was born in this country or not. But there are limits to the conclusions that can be drawn from this analysis. Regression analysis searches for evidence of stable relationships between variables; it cannot establish causal relationships between them. And the reliability of the results are contingent upon a whole set of assumptions being valid (Greene (1997)).

Data from the Labour Force Survey (LFS) provide information on the employment status and characteristics of around 100,000 people in the UK household population each quarter. These data can be used to assess how migrants fare in the UK labour market relative to individuals born in this country. A regression of an individual's employment status on a set of time dummies (which will capture variation in the state of the economic cycle) and a dummy variable which takes the value one if an individual is a migrant (and zero otherwise) offers a simple guide to whether migrants are more or less likely to be employed than those born in this country. If the coefficient on the migrant 'dummy variable' is positive and significant, then migrants are more likely to be employed.

The probability that an individual is employed is also likely to depend on their characteristics (age, gender, qualifications) and the local labour market in which they search. A series of controls are therefore included in the regression to isolate the impact of migrant status on employment status. The dependent variable in this regression can only take two values (people are either employed or they are not) so a logit regression is used in preference to a standard least squares regression.(2) These stylised regressions, which are estimated over LFS data from 1992 to 2005, indicate that migrants are on average less likely to be employed than those individuals born in the United Kingdom (**Table A**).(3) That does not imply that all migrants are less likely to be employed than those born in this country. For example, these results may not be representative of the labour market performance of the recent wave of migrants from the Accession countries if those individuals differ from the typical migrant in terms of their financial circumstances or their preferences between work or leisure.

Table A Logit regressions of employment status

Coefficient	-0.206	-0.560	-0.520	-0.486
Standard error	0.004	0.005	0.005	0.005
Regression includes:				
Time controls (macro effects)	✓	✓	✓	✓
Demographic controls	✘	✓	✓	✓
Qualification controls	✘	✘	✓	✓
Regional controls	✘	✘	✘	✓

A regression of an individual's usual working hours on a set of time dummies (to capture the trend in usual hours) and the migrant dummy variable described above offers a simple comparison of the working hours of migrants and those born in the United Kingdom. If the coefficient on this dummy variable is positive and significant that implies migrants tend to work longer hours. This regression can also be augmented with a set of demographic controls, since working hours may vary with age and gender, and arguably controls for the occupation and industry in which an individual works.(4) The LFS data on hours are censored from above and below (people cannot work less than zero hours, and all responses above 97 hours are recorded as 97) so a tobit regression is used.(5) Migrants appear to work longer hours when employed: the coefficient on the migrant dummy is positive and statistically significant across a range of specifications (**Table B**).(6)

Table B Tobit regressions of usual working hours

Coefficient	1.543	1.095	0.922	1.068
Standard error	0.045	0.040	0.038	0.038
Regression includes:				
Time controls (macro effects)	✓	✓	✓	✓
Demographic controls	✘	✓	✓	✓
Qualifications	✘	✘	✓	✓
Regional controls	✘	✘	✘	✓

(1) See Dustmann *et al* (2005) for a similar analysis of this issue.
(2) The fitted values of the regression describe the estimated probability that an individual with a given set of characteristics will be employed. The logit regression ensures that those fitted values lie between zero and one and can be interpreted as probabilities; the least squares regression does not impose this restriction (see Greene (1997)).
(3) The regressions suggest that the employment rate of migrants is several percentage points lower than that of similar individuals who were born in this country.
(4) The industry in which an individual works and their occupation are endogenous so it is not obvious that these controls should be included in the regression. Migrants could be more likely than those born in this country to choose to work in occupations and industries which offer unusually long or short working hours. If these controls are included in the regression then unless migrants work longer hours than other workers within those occupations or industries the results will imply that working hours do not vary systematically between migrants and those born in this country.
(5) The tobit model constrains the fitted values of the regression to lie between these upper and lower bounds (see Greene (1997)).
(6) The regressions suggest that migrants work about an hour longer than those individuals who were born in this country.

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Potential employment in the UK economy

By Richard Barwell, Venetia Bell and Philip Bunn of the Bank's Monetary Analysis Division, and Maria Gutiérrez-Domènech formerly of the Bank's Monetary Analysis Division.

This article discusses a range of factors that may shift the level of UK potential employment — that is, the amount of labour that can be sustainably employed by UK companies to produce goods and services. The level of potential employment reflects four factors: the size of the adult population; the willingness of that population to participate actively in the labour market; the sensitivity of wages to the unemployment rate; and the average number of hours that people are willing to work when employed. Rapid growth in the UK population has been the primary source of growth in potential employment over the past ten years. Structural changes in the labour market are likely to have also enabled a modest increase in the equilibrium participation rate and a decline in the equilibrium unemployment rate which would have further boosted potential employment. But those developments have been partly offset by the continued downward trend in desired working hours.

Introduction

The balance between demand and supply in the labour market shapes the near-term outlook for inflation, because it affects the rate of growth of companies' production costs. In the long run if companies set prices as a mark-up over costs, then inflation will tend to reflect the rate of growth of production costs in the private sector (although in the short run firms may be able to reduce their margins or put downward pressure on costs). Long-term stability in price inflation therefore requires stable growth in production costs. Labour costs are a key component of those costs: the cost of producing an additional unit of output will in part reflect the cost of employing sufficient labour to produce that output — in other words, the level of wages relative to labour productivity. So for inflation to be stable in the long term the wedge between the rate of growth of nominal wages and labour productivity must also be constant. For that to happen, the labour market must be in equilibrium — that is, employment must stabilise around its sustainable level, referred to in this article as the level of potential employment.

When the demand for labour rises above the level of potential employment, the cost of employing labour will tend to rise faster than the value of the output that workers produce. And when labour demand falls below potential, production costs will tend to rise at a slower rate, as wage growth lags behind the rate at which the output that workers produce is increasing in value. The level of potential employment provides a reference point against which the current level of employment can be compared to describe the degree of inflationary pressure coming out of the labour market. Unfortunately, the level of potential employment cannot be directly measured, but if monetary policy makers want to gauge the amount of inflationary pressure in the labour market they need to try to make inferences about the likely level of potential employment.

The level of potential employment will reflect a whole range of factors which collectively determine the location of the aggregate labour demand and supply curves — that is, the amount of labour that companies require and the amount of labour that people are willing to provide at any given hourly real wage rate. Potential employment can be decomposed into four components: population; the equilibrium participation rate; the equilibrium unemployment rate; and equilibrium hours worked. This decomposition is discussed in the box on page 61. The rest of the article explores structural changes in the labour market which could have shaped the path of each of these components over recent decades.

Population

Aggregate potential employment will reflect the sum total of individual decisions by members of the UK adult population to supply labour at any given wage. So increases in the size of the UK adult population will boost potential employment: larger populations can support larger workforces.

Decomposing potential employment

Actual employment is measured in terms of the total number of hours worked by employees.(1) The total number of hours worked in the economy (l) can be decomposed into its constituent parts: the number of people in the adult population (pop); the fraction of that population that actively participates in the labour market (pa); the fraction of that actively participating population that is unemployed (u); and the average number of hours worked by those individuals who are employed (avh):(2)

$$l = avh \times (1 - u) \times pa \times pop$$

This article uses an identical decomposition for potential employment (the number of hours that could be employed by companies – l^*) into its corresponding equilibrium determinants: the size of the adult population, the participation rate (pa^*); the unemployment rate (u^*) and average hours worked (avh^*). The equilibrium concepts abstract from the effects of cyclical movements in the economy:

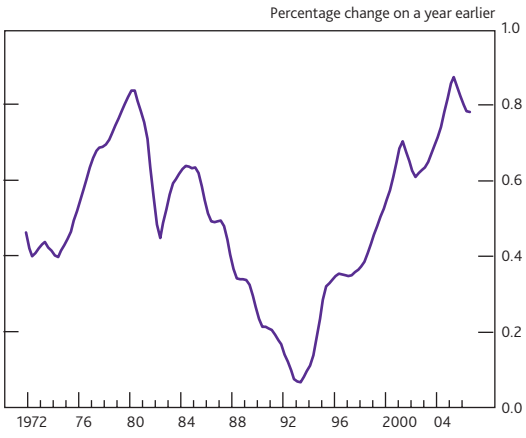
$$l^* = avh^* \times (1 - u^*) \times pa^* \times pop$$

With the possible exception of the population, none of these equilibrium components can be directly measured, although persistent movements in actual participation, unemployment and hours worked are likely to be indicative of underlying movements in their equilibrium counterparts. The advantage of this decomposition is that it can help draw out how structural change in the labour market can affect the level of potential employment, because reforms such as the introduction of tax credits or working-time regulations should affect potential employment through particular channels.

(1) Actual and potential employment will include the self-employed as well as those directly employed by companies. The factors which influence the decision whether to become self-employed or to work for a company are not discussed here. This article focuses on the factors which affect the decision about whether to work at all. For more details on the reasons why people choose to become self-employed see Rees and Shah (1986) and Taylor (1996).
(2) This decomposition follows the 'stock' approach to the labour market — that is, dividing the population according to which state they are currently in: employed, unemployed and economically inactive. There is an alternative approach which focuses on the flows between these states (see Blanchard and Diamond (1992)).

Population data are subject to considerable uncertainty. The latest figures from the Labour Force Survey (LFS) suggest that the adult population of the United Kingdom has increased by around 0.8% per year in 2005 and 2006 (**Chart 1**). The current pace of population growth is rapid by recent historical standards. Holding other factors constant, this implies that the level of potential employment has also been expanding at a rapid rate. The pickup in the pace of UK population growth over the past ten years to its current high level is accounted for by both natural change and net inward migration, although official estimates suggest migration has made a larger contribution in the most recent data (**Chart 2**).(1) Estimates of international migration flows are extremely uncertain, and it is possible that the official data understate the current rate of growth of the adult population, and therefore the level of potential employment.(2)

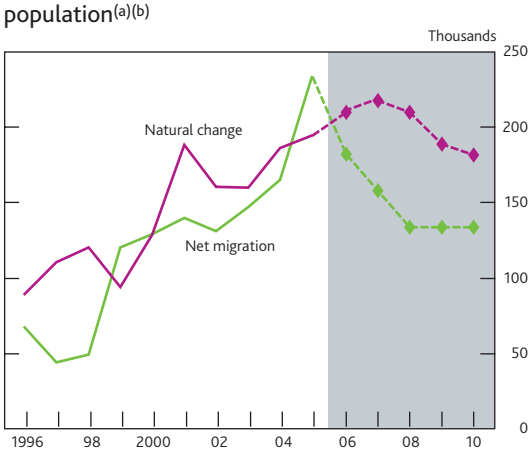
Chart 1 The UK adult population(a)



Source: Labour Force Survey.

(a) Latest LFS population data are based on mid-2005 population estimates and experimental quarterly population estimates.

Chart 2 Sources of change in the UK adult population(a)(b)



Sources: Government Actuaries Department (GAD)/ONS and Bank calculations.

(a) Breakdown of historical change in the 16+ population is estimated using net migration data for the 15+ population.
(b) Latest GAD/ONS population projections are consistent with the mid-2004 population estimates that were published in October 2005.

(1) The population estimates only include permanent migrants; they do not include temporary foreign workers who can also contribute to potential employment.
(2) For more detail on international migration data and the impact of migration on potential employment see Barwell (2007).

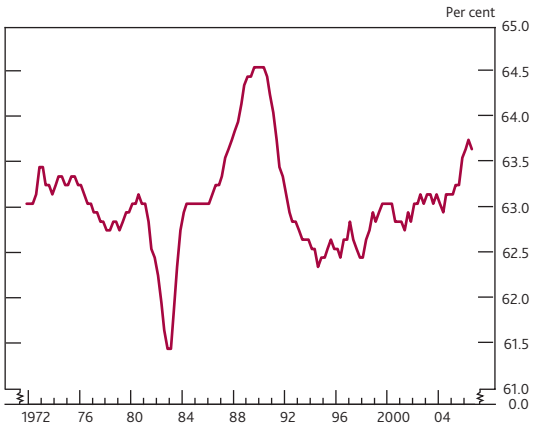
Population growth is typically assumed to be independent of the state of the economic cycle. In other words, it does not depend on whether resources are currently being used above or below normal levels. So any cyclical variation in the amount of labour employed is assumed to reflect variation in the fraction of the population who are in work and the average number of hours they work. But that assumption may be too simplistic, given the key role played by net migration in driving recent UK population growth.(1) Some of these migrants may have chosen to travel to the United Kingdom because of the relatively buoyant state of the UK labour market. So the recent growth in the UK population may overstate the growth in potential employment, because some of these migrants may return home in the future if the UK labour market becomes less buoyant than overseas labour markets.(2)

The composition of the population can also affect potential employment. As the following sections show, the probability of being in work, and the average number of hours worked when in employment, vary markedly across different subsets of the UK adult population. In some cases those differences will reflect variation in demand for labour. But in many cases, differences in participation rates or working hours may reflect differences in supply.

Equilibrium participation rate

At any point in time, only a fraction of the adult population will be economically active, or participating in the labour market — that is, either in employment or searching for work. Movements in the participation rate will reflect both cyclical and structural factors. If wages temporarily rise in a boom when the demand for labour is high — as they did in the late 1980s — then there is a greater incentive for people to search for work (**Chart 3**). Any such cyclical increase in the participation rate will not be reflected in a corresponding increase in the equilibrium participation rate or the level of potential employment.

Chart 3 The participation rate



Source: Labour Force Survey.

Structural changes which alter the incentives to search for work — as may have happened in the late 1990s — will affect the participation rate. These changes will also affect the equilibrium participation rate and hence the level of potential employment. This section explores the factors that could affect the equilibrium participation rate.

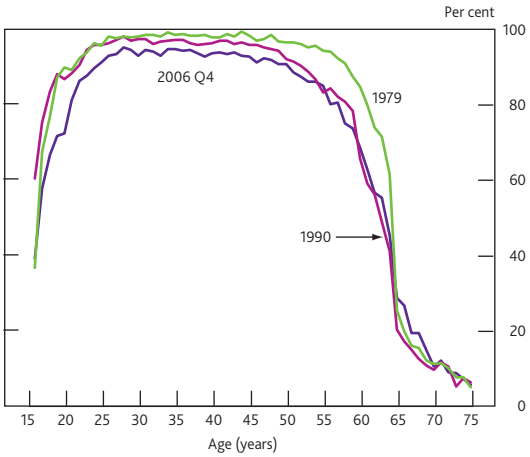
Demographics

Participation rates vary markedly across different demographic groups. A change in the composition of the population can therefore affect the aggregate equilibrium participation rate. Changes in the fertility rate in the post-war period (the 'baby boom' and 'baby bust') and increased life expectancy have had a profound impact on the age structure of the UK population. During the 1990s members of the baby-boom generation were entering middle age, when participation rates tended to be high. That shift in the age composition of the population is likely to have temporarily boosted the equilibrium participation rate. But as the baby boomers approach and pass retirement age, demographics may start to push down on the equilibrium participation rate.

Retirement

Many people stop participating in the labour market once they have accumulated sufficient savings to fund consumption in retirement. The decline in participation among middle-aged men through the 1980s can in part be accounted for by an increase in the number of people taking early retirement (**Chart 4**). More men taking early retirement in the early 1980s may also have reflected a lack of suitable job opportunities for those who were previously employed prior to the recession and a greater willingness of companies to let them retire at a time when pension funds were well funded.

Chart 4 Age-specific participation rates among men

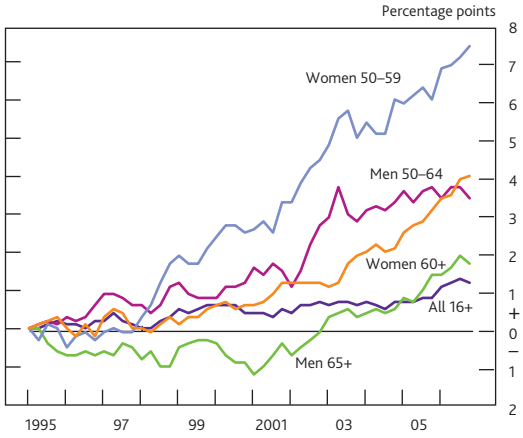


Source: Labour Force Survey.

(1) See Barwell (2007).
(2) This statement refers to the permanent UK resident population. If improved labour mobility has increased the pool of overseas residents who are willing to migrate to the United Kingdom it could be argued that UK potential employment has increased.

Since the late 1990s participation rates among older people have started to rise (**Chart 5**). This may reflect concerns over the adequacy of savings to fund consumption in retirement. People now expect to live longer in retirement, so they may have revised up their desired level of savings to fund consumption in retirement accordingly. The shift from defined benefit (DB) towards defined contribution (DC) occupational pension schemes may have further reduced the incentive to retire early. And increasing labour market flexibility has allowed many older workers who want to continue to work to do so, but often perhaps by working shorter hours.(1)

Chart 5 Changes in participation rates by age and gender, since 1995 Q1

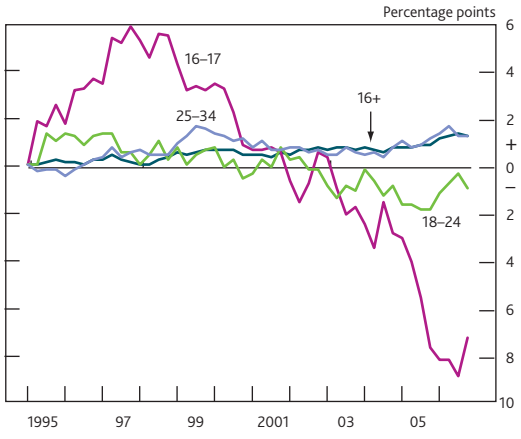


Source: Labour Force Survey.

Full-time study

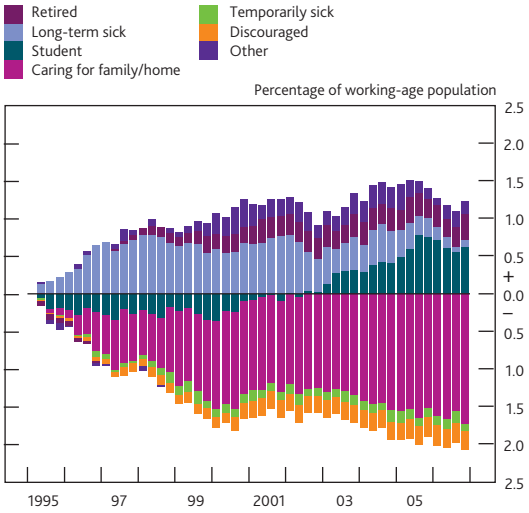
At the other end of the age spectrum, participation rates among young people have fallen (**Chart 6**). The fraction of the working-age population who report that they are not participating because they are students has risen by around 1 percentage point over the past six years (**Chart 7**). Young people may choose to delay entering the labour market so that they can study. Students may lose out on income in the short run, but they may be able to earn higher wages once they graduate, so that they can increase their lifetime consumption. The continued expansion of the post-compulsory education system is therefore one factor which may explain why the participation rate has fallen among people aged under 24.(2)

Chart 6 Changes in participation rates by age, since 1995 Q1



Source: Labour Force Survey.

Chart 7 Changes in working-age inactivity by reason, since 1995 Q1



Source: Labour Force Survey.

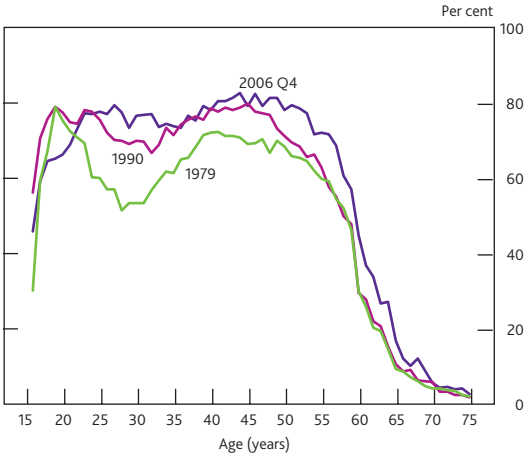
Fixed costs of work: childcare

Some individuals may find that it is not in their interest to search for work, because the costs involved in taking a job are prohibitively high. For example, parents with young children have to pay the fixed and variable costs of childcare if they want to participate in the labour market: the costs of taking children to and from a nursery; and the hourly cost of childcare. Once those costs have been deducted from their earnings, some parents may find that there is little incentive to work.

Historically, women have tended to earn lower wages than men. Given that gender pay gap, there may have been an economic incentive for women to stay at home to care for their children rather than pay for childcare. But rising educational attainment among women and reduced discrimination have helped to narrow the gender pay gap. Alongside improvements in maternity rights, this has generated a stronger incentive for mothers to return to work (Gregg, Gutiérrez-Domènech and Waldfogel (2003)). And more recently, increased state provision of nursery care and tax incentives such as childcare vouchers have reduced the costs of childcare. As a result, participation has risen among women between the ages of 25 to 40 (**Chart 8**), who would be most likely to have young children, helping to explain the overall rise in female participation (**Chart 9**). Consistent with this, the fraction of the working-age population who give

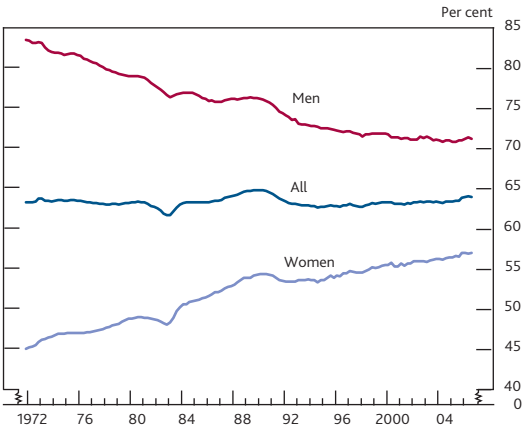
(1) New anti-age discrimination laws came into effect in October 2006.
(2) Although this may increase the participation rate of these people in later life.

Chart 8 Age-specific participation rates among women



Source: Labour Force Survey.

Chart 9 Participation rates by gender



Source: Labour Force Survey.

caring for their family as their reason for not participating has fallen by over 1½ percentage points since 1995 (**Chart 7**).

Fixed costs of work: 'inactivity traps'

Another example of the fixed and variable costs of work are the social security payments that individuals may lose when they find a job. Entitlement to benefits can be withdrawn either completely when people find work or on a pound-for-pound basis with any additional income earned from work, so that individuals face very high marginal tax rates when they start work. Individuals who expect to earn relatively modest wages are caught in an 'inactivity trap': there is little or no incentive for them to participate, because they are no better off if they find work. Successive governments have introduced tax credits, such as Family Credit and the Working Families Tax Credit, to reduce these high marginal tax rates. These credits are designed to increase people's take-home pay for a given pre-tax level of earnings, by providing the low-paid with either an explicit benefit or tax credit. And reforms that reduce the level or entitlement to social security benefits will have encouraged people to participate in the labour market and search for work.

Long-term sickness

Between 1985 and 1996 the number of men claiming sickness-related benefits increased from 830,000 to 1,630,000 (Nickell and Quintini (2002)). It is extremely unlikely that the incidence of serious disability actually doubled over this period, and more likely that the pickup in long-term sickness claimants largely reflected the design of the benefit system. Many of these individuals had been unemployed for some time before they made their claim for invalidity benefit, which was somewhat more generous than unemployment benefit. There is some evidence to suggest that some unemployed claimants may have been encouraged to file claims for invalidity benefits (National Audit Office (1989)). Invalidity benefit was replaced with incapacity benefit in April 1995, and in the process the financial incentive for older men to switch from unemployment to sickness-related benefits was reduced. These reforms may have helped to stem the rise in long-term sickness claimants: the fraction of the working-age population who reported being inactive because they are long-term sick stabilised in 1998 and has since begun to fall (**Chart 7**).

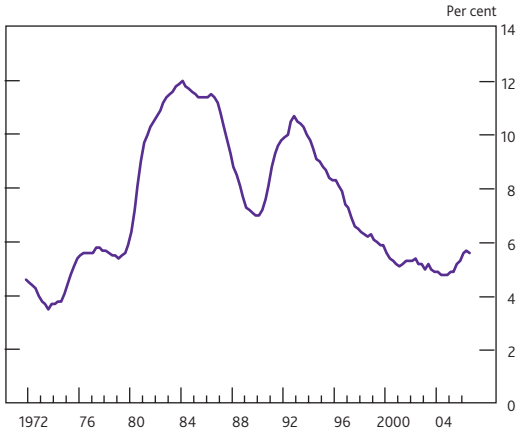
Equilibrium unemployment rate

At any moment in time, only a fraction of those individuals who participate in the labour market will be employed. The remainder are unemployed: out of work, and looking for a job. The size of the unemployment pool can affect the wage bargain between workers and companies. The smaller that pool is, the stronger the position workers are in to push for wage increases in excess of the increase in their productivity, as it is harder for firms to replace them. There is some level of unemployment at which the pool of available labour is just sufficient to keep wages growing in line with productivity, which can be interpreted as an equilibrium. At that point there is no pressure from the labour market for companies to change prices.

The unemployment rate moves with the economic cycle (**Chart 10**). When labour demand is weak, the unemployment rate will typically rise above its equilibrium, whereas during an expansion unemployment tends to fall below its equilibrium as the demand for labour is strong.

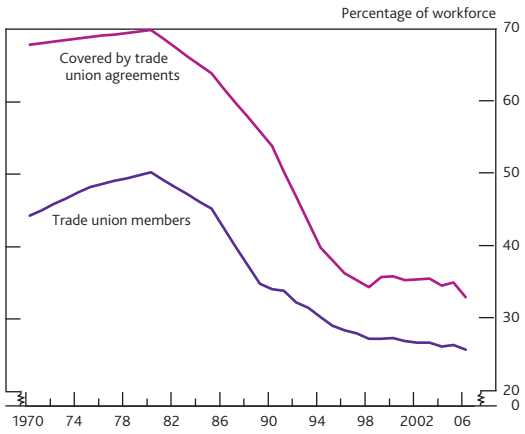
However, actual unemployment may also respond to changes in the underlying equilibrium rate of unemployment that are independent of the cycle. The unemployment rate fell steadily over the 1990s, to levels last recorded in the 1970s (although it has risen somewhat over the past 18 months). In part, that trend decline is likely to reflect a shift in the equilibrium unemployment rate.

Chart 10 The unemployment rate



Source: Labour Force Survey.

Chart 11 Union density and coverage



Sources: Labour Force Survey and Nickell and Quintini (2002).

This section explores factors that may affect the equilibrium rate of unemployment. Equilibrium unemployment will reflect the design of the various institutions that operate in the labour market — trade unions, social security benefits, government policies — because they determine how wages respond to the size of the unemployment pool (Bean (1994)). The lower the equilibrium unemployment rate, the larger the amount of labour that can be employed — that is, the higher the level of potential employment.

Trade unions

One factor which may have led to a fall in the equilibrium unemployment rate is the decline in the power and coverage of trade unions. Trade unions can use their power as the collective representative of workers to bargain with employers to raise wages.(1) Companies may then respond to an increase in wages by cutting back on the size of their workforce, until the productivity of their remaining workers rises to compensate companies for the higher cost of employing labour. In this scenario, wages and productivity are higher, but the level of employment is lower. So the more powerful trade unions are — that is, the greater their ability to raise wages — the higher the equilibrium unemployment rate may be.

The fraction of the UK workforce who are members of a trade union, or whose wages are covered by an agreement made by a trade union, declined substantially over the 1980s and to a lesser extent the 1990s (**Chart 11**). In part that reflected changes in legislation that empowered companies to avoid entering into a formal bargaining process with trade unions. Those changes in the size of the trade union movement, together with legislative changes in the legal environment in which trade unions operate, reduced their ability to induce companies to pay higher wages. Declining union power may also reflect the changing industrial composition, as service sector industries, which are generally less unionised than manufacturing, became more important in the economy.

These changes may have put downward pressure on the equilibrium unemployment rate since the early 1980s.

Changes in the benefit system

Another factor that could have affected the equilibrium unemployment rate is the benefit system. If the replacement ratio is high — that is, if the gap between benefits and wages is relatively small — then people may not search so intensively for work, because their benefits provide a reasonable level of consumption. That will tend to raise the equilibrium unemployment rate. There is also evidence that search intensity responds to the expiry of benefit (Meyer (1990)). When there is no time limit on how long people can claim unemployment benefit, on average, they tend to remain unemployed for longer.

There have been a series of reforms to social security benefits from the late 1970s onwards motivated in part by these concerns about the impact of benefits on the equilibrium unemployment rate. There have been changes to: the level of the benefits that the unemployed receive; the types of people who are entitled to claim benefit; the conditions attached to receiving it; and, the amount of time that people can claim certain benefits (Nickell and Quintini (2002)). These changes may have reduced the equilibrium unemployment rate, because they should have increased the intensity with which the unemployed search for work.

Active labour market policies

It is possible that active labour market policies (ALMP) may have reduced the equilibrium unemployment rate by reducing the incidence of long-term unemployment. Successive governments have experimented with ALMP, such as the Restart programme or more recently the New Deals. These schemes try to help the long-term unemployed back into jobs

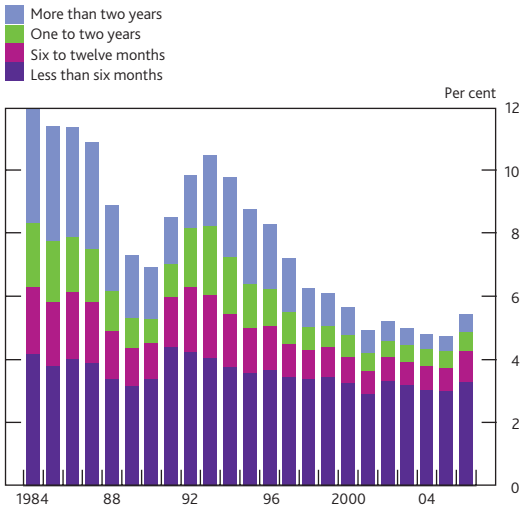
(1) Although unions may also have objectives to maintain employment.

either directly, by subsidising companies to employ them, or indirectly, by providing training to improve their ability to search for work.

Statistically, only a small proportion of the long-term unemployed find work in each period. That may reflect the fact that employers interpret long-term unemployment as a signal that those individuals will not be the most valuable employees. Also, prolonged experience of unemployment may damage an individual's productivity. And it may be that the long-term unemployed search less intensively for work because they have become disillusioned by their experiences. Companies may be less willing, or able, to recruit new employees if the unemployed pool is predominantly made up of long-term unemployed individuals, so the overall level of potential employment may be lower.

Abstracting from cyclical movements, there is some evidence of a trend decline in the fraction of the unemployed who have been continuously out of work for a long period of time (**Chart 12**), partly as a result of these programmes (see Dolton and O'Neill (1996) and Van Reenen (2003)). It is possible that these schemes have helped to reduce equilibrium unemployment.

Chart 12 The decline in long-term unemployment



Source: Labour Force Survey.

Demographics

The equilibrium unemployment rate may also be affected by changes in the demographic composition of the population. Unemployment rates are significantly higher among the youth population, compared with those in middle-age, which may reflect the fact that youths have to go through a process of 'job shopping' when they enter the labour market and search through a series of jobs before they find a productive match. During this period of 'job shopping' youths may suffer more frequent periods of unemployment when they quit unsuitable jobs (Barwell (2000)). Youths may not be as effective as older job seekers at filling vacancies, and therefore will put less pressure on wages. So the decline in the youth share of the adult population during the 1990s could have contributed to a fall in equilibrium unemployment.

Equilibrium average hours worked

The amount of time that the typical British worker spends at work varies from quarter to quarter. In part, those changes in average working hours reflect the state of the economic cycle (Shortall (2002)). Companies will want their staff to work longer hours to produce more when demand is temporarily high, and people will want to work longer hours when the return from doing so is temporarily high. But over and above these cyclical variations in working hours, there is also evidence of a downward trend in hours worked over recent decades (**Chart 13**). In fact, average working hours are thought to have been on a downward trend for a century or more, which indicates that structural factors have led to a decline in equilibrium working hours. This downward trend in working hours is also apparent in recent data for most other developed economies, suggesting that those structural factors are likely to have been common across countries.

Chart 13 Average hours worked

Source: Labour Force Survey.

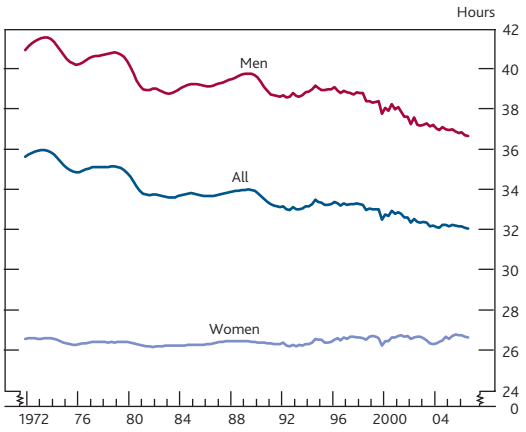
Rising real wages are likely to have been one factor helping to explain the trend decline in average working hours across countries. A permanent increase in the post-tax real hourly wage — that is, the amount of consumption that an extra hour of labour can purchase — will have two effects on labour supply decisions. There is a substitution effect: the opportunity cost of not working (in terms of foregone consumption) has increased so people will want to work longer hours. And there is an income effect: each hour of work enables more consumption so people can reduce their working hours (and enjoy more leisure) and still enjoy more consumption. The evidence suggests that these two effects broadly offset, with the income effect marginally dominating.(1)

(1) According to Kimball and Shapiro (2003): 'a tripling of per capita income perhaps yields a reduction of an hour or two in average weekly hours'.

The downward trend in average hours worked may also be a result of increasing participation among particular groups who generally work fewer weekly hours than the average of the population. **Chart 9** shows how participation rates among women have risen over the past 30 years, while the participation rate of men has declined. On average, women work fewer hours than men (**Chart 14**), partly because of a higher incidence of part-time working among women. So, increasing participation among women will reduce overall average hours via a simple averaging effect.

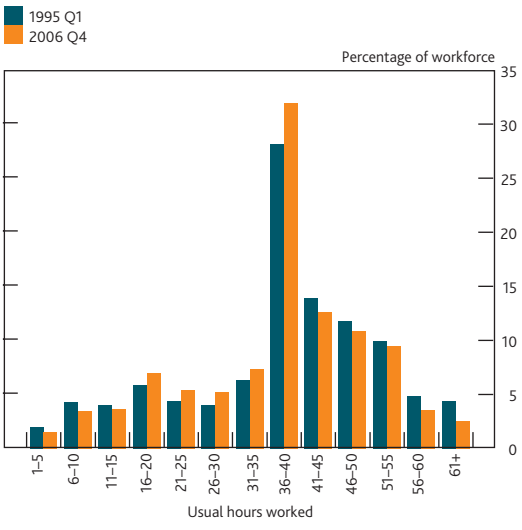
The distribution of average hours worked appears to have narrowed over time (**Chart 15**).(1) The fraction of the workforce in the left and right-hand tails of the distribution has fallen, indicating that the number of people usually working both short and long hours has fallen. The next section explores possible supply-side factors that could have driven these shifts in the distribution of working hours.

Chart 14 Average hours worked by gender



Source: Labour Force Survey.

Chart 15 Distribution of usual hours worked



Source: Labour Force Survey.

Why are there less people working very short hours?

The introduction and expansion of the tax credits system may have raised working hours at the bottom end of the distribution. These credits are designed to encourage people to search for work, by raising the pay-off from an hour of work (the post-tax real wage). But to qualify for these tax credits, people have to work a minimum number of hours each week, so they may have provided a financial incentive for individuals below that threshold to increase their working hours.(2) But the impact on working hours is not unambiguous. For those individuals who qualify for the scheme who were already working above the hours threshold there may be an incentive to reduce hours.(3) There may also be non-benefit reasons why there are less people working very short hours; for example increasing use of flexible working arrangements.

Why are there fewer people working very long hours?

One reason why people might work long hours is to increase their future earnings. Employees in some occupations appear to work long hours to signal to their managers that they are suitable for pay and promotion.(4) It is possible that a change in social norms (about the importance of work-life balance) or government legislation may have reduced competition along the hours dimension of effort.

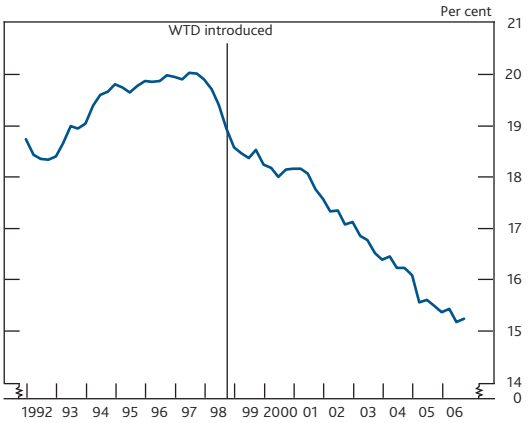
Government legislation may have played a more direct role in reducing working hours. The European Directive on Working Time (WTD) was introduced into UK law on 1 October 1998. The WTD included a 48-hour limit on the number of hours employees could be asked to work within a typical week, and a right to a minimum number of weeks of paid leave.(5)

There is circumstantial evidence to suggest that the decline in average hours worked, and in particular the decline in the number of people working long hours, was at least partly driven by the WTD (**Chart 16**). The fraction of the workforce usually working more than 48 hours a week has fallen by about 4 percentage points since the WTD was introduced.

The WTD was not prescriptive: workers were not forced to reduce their working hours. So the legislation should only have had an impact on working hours if there were significant numbers of people who were working more hours than they

(1) **Chart 15** shows the distribution of the number of hours that people usually work in their main job, to abstract from variation in working hours due to holidays or sickness. The picture for actual hours worked is very similar.
(2) For example, people had to work 16 hours each week to be eligible for both Family Credit, and the Working Families Tax Credit, and they gained an additional credit if they work more than 30 hours.
(3) See Blundell, Duncan, McCrae and Meghir (2000).
(4) For more details on such 'tournament' models see Lazear and Rosen (1981). For evidence of tournaments operating in practice see Bell and Freeman (2000); and Landers, Rebitzer and Taylor (1996).
(5) The WTD also provided for: one day's rest in seven (or two in a fortnight); eleven hours' rest between working days; a 20-minute rest break if the working day exceeds six hours, health assessments for night workers; and an eight-hour limit on night working. Typical working hours are calculated over a 17-week averaging period. Certain groups of workers, such as doctors and those employed in the transportation sector, were initially excluded from the legislation, but have subsequently become covered by it.

Chart 16 Percentage of workers who usually work over 48 hours a week



Source: Labour Force Survey.

wanted to. It is possible that the introduction of the WTD allowed some of these workers to reduce their hours. There is some evidence that a significant fraction of the workforce are still unhappy with their current working hours: over one third of the workforce would prefer to work fewer hours at their current hourly wage rate; and the majority of those working above 48 hours each week would prefer to cut their hours.(1)

Finally, it is also possible that the decline in long-hours jobs could reflect a shift in labour demand. Companies' preferences may have shifted towards employing more people and asking them to work fewer hours within a given target for the total amount of hours of labour input.(2) For example, if manufacturing companies prefer their employees to work longer hours than service sector companies, then the shift in industrial composition of the workforce could have led to a demand-driven reduction in working hours.

Conclusions

This article has described some of the key factors that are likely to have influenced the level of potential employment over recent decades. Shifts in potential employment will reflect shifts in one of four constituent parts: the size of the adult population; the equilibrium participation rate; the equilibrium unemployment rate; and equilibrium average hours worked. Rapid population growth has played a key role in driving growth in potential employment over the past decade. Structural changes in the labour market which have led to a rise in the equilibrium participation rate and a decline in the equilibrium unemployment rate are also likely to have boosted the level of potential employment. But that has been partly offset by a decline in desired working hours. **Table A** summarises the factors influencing potential employment discussed above.

Table A Summary of impacts on potential employment

	Factors increasing potential employment	Factors reducing potential employment
Population	Natural population growth	
	Net migration	
Equilibrium participation rate	Demographics (1990s)	Increasing full-time study
	Later retirement (from 1990s)	Early retirement (1980s)
	Lower fixed costs of work	Rising long-term sickness
Equilibrium unemployment rate	Decline in trade union power	
	Benefit reforms	
	Active labour market policies	
	Demographics (1990s)	
Equilibrium average hours		Real wage growth
		Increased female participation

(1) Labour Force Survey data for 2006 Q4.
(2) This should reflect the costs of employing an additional head or hour of labour relative to the amount of output that can be produced by an additional head or hour of labour (Hamermesh (1993)).

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The role of household debt and balance sheets in the monetary transmission mechanism

By Andrew Benito, Visiting Scholar, International Monetary Fund, Matt Waldron, Garry Young and Fabrizio Zampolli of the Bank's Monetary Assessment and Strategy Division.

There is considerable uncertainty about the effect of household debt on the macroeconomy and its role in the monetary transmission mechanism. This article summarises conclusions from recent Bank of England research aimed at shedding light on this issue. It argues that the extent to which levels of household debt affect the outlook for the economy and the way in which the economy responds to unexpected developments, depends on the circumstances of individual borrowers and lenders, as well as wider economic conditions. Recent evidence suggests that there has been little difference in the amount by which the spending of high and low debt households has responded to changes in those households' financial position. This is likely to be because the benign economic environment and favourable lending conditions have made it easier for households to smooth over adverse shocks. Nevertheless, adverse interactions between debt, house prices and consumption could arise in other circumstances. As such, there is a need to keep this situation under review by continued monitoring of household and lender balance sheets.

Introduction

The stock of outstanding household debt in the United Kingdom has roughly doubled since 2000. Higher debt levels can have a range of implications. For some households, debt repayments may turn out to be difficult to meet. This can result in them having to restrain their spending and, in extreme circumstances, seek bankruptcy or other forms of debt relief. This is a serious issue for the households concerned. But currently households seeking bankruptcy protection or debt rescheduling account for only a small share of overall spending. As such, these extreme cases have only limited relevance for the setting of monetary policy.(1)

More generally, however, there is no clear consensus on whether higher debt levels necessarily affect the outlook for aggregate consumer spending or the size and speed of the response of spending to changes in the economic environment, including interest rates. Conventional economic analysis suggests that consumption choices depend on debt only to the extent that debt affects household net wealth. But there is also a long history, going back at least to Irving Fisher in the 1930s, of mainstream economists who have dissented from this view.(2) They would argue that, in some circumstances, debtors might respond differently to shocks than creditors, so that, for a given level of net wealth, aggregate outcomes are affected by the amount of debt outstanding and its distribution. Moreover, the interaction between household spending, market prices and the actions of lenders could accentuate these effects.

Recent research at the Bank has aimed to clarify the circumstances under which debt has an 'active' role in the transmission mechanism and whether the potency of monetary policy depends on the state of the household sector's aggregate balance sheet. This article sets out the main conclusions from that research.

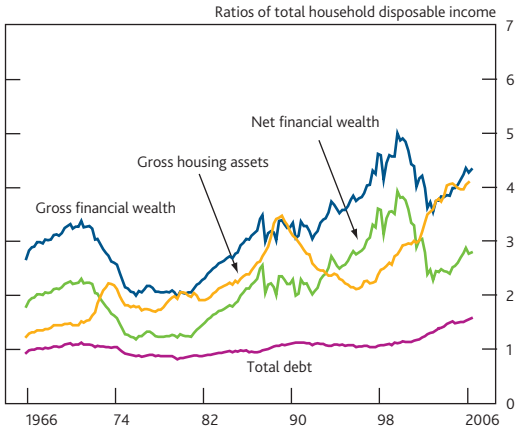
Major developments in the household sector balance sheet

Although debt has grown very quickly in recent years, in aggregate it has mainly been used to finance asset accumulation rather than spending on goods and services. That is apparent from **Chart 1**, which shows that the increase

(1) See Waldron and Young (2006) for recent evidence on the incidence of financial difficulties among British households.
(2) Fisher's views are discussed in King (1994).

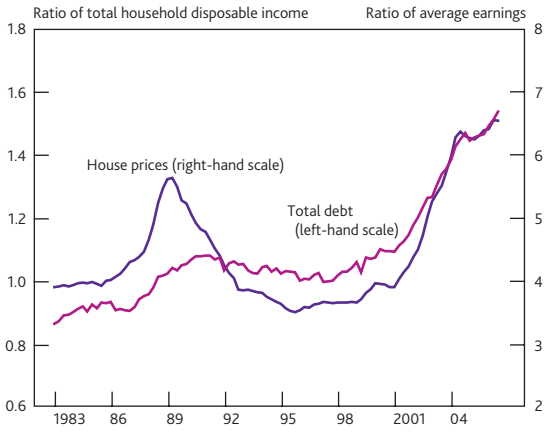
in household debt since the early 1990s has not coincided with a decline in household net wealth, as would be expected if the household sector as a whole were drawing down its wealth to pay for higher consumption.(1) In fact, the overall net financial position of the UK household sector in 2006 was little different from that in the early 1990s.(2) So the view that the United Kingdom has experienced a long-lived consumption boom 'funded by a tidal wave of debt' is misleading (Nickell (2004)).(3) Instead, the evidence suggests that the growth in household debt (about 80% of which is in the form of mortgages) has been associated in large part with higher house prices (**Chart 2**).

Chart 1 Household wealth



Sources: Bank of England, Halifax and ONS.

Chart 2 Household debt and house prices



Sources: Bank of England, Halifax and ONS.

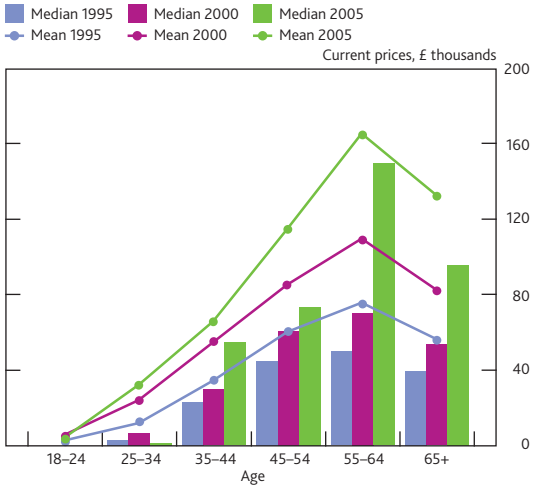
Higher house prices have meant that new entrants to the housing market have needed to borrow more to finance their purchase (Hamilton (2003)). The effect of this on the aggregate balance sheet depends on what the ultimate sellers of houses do with the proceeds.(4) If the increased debt of the new entrants is exactly matched by the reduced debt of the sellers, then there need be no effect of housing transactions on aggregate debt. But in many cases the ultimate sellers are people with small or no mortgages. As such, they are more likely to add the proceeds of the house sale to their financial assets. In this way, higher house prices might be associated with higher financial assets as well as higher debt.(5) So, increased indebtedness has not been associated with a deterioration of the aggregate household sector balance sheet, but instead has been associated with higher house prices and a change in the distribution of financial assets and debts across households.

Some indication of how the distribution of balance sheets has changed can be gained from household-level surveys.(6) Here information is taken from the 1995 and 2000 waves of the British Household Panel Survey and the 2005 NMG Research survey carried out for the Bank (Barwell, May and Pezzini (2006)). **Chart 3** shows that older households (aged 55 and over) experienced the largest gains in net financial wealth and the value of their housing assets between 2000 and 2005. By contrast, **Chart 4** shows that middle-aged households (35–54 year olds) increased their indebtedness the most over that period. That likely reflects the high homeownership rates among these age groups. Similarly, a decline in homeownership rates among 25–34 year olds likely explains why that group's median net financial wealth plus housing assets and median indebtedness fell between 2000 and 2005. The fact that median indebtedness tended to fall between 2000 and 2005, while mean indebtedness tended to rise suggests that the distribution of debt has become more skewed with fewer households borrowing larger amounts (Waldron and Young (2006)).

Thus the growth in debt in recent years has been associated with a substantial change in the distribution of debt as middle-aged households (35–54 year olds) have tended to borrow more, possibly to keep up with rising house prices, while younger households (18–34) have borrowed less possibly because they have not entered the housing market.

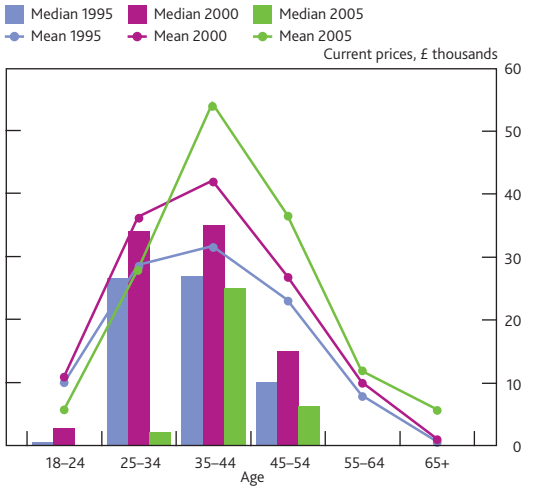
(1) A similar pattern is also apparent in other countries (OECD (2006)). See also Debelle (2004).
(2) The increase in the value of housing assets does not necessarily imply that the household sector as a whole is better off. Not only do people own houses, they also live in them, and so, in aggregate, increases in the value of people's homes are broadly offset by increases in the future cost of housing. See Benito, Thompson, Waldron and Wood (2006).
(3) This is not to say that a minority of households have not financed spending by unsustainable borrowing.
(4) Most sellers of houses also simultaneously purchase another property. For those new purchasers without a property to sell, there is also an ultimate seller not intending to buy another property. These include sellers moving into rented accommodation or moving abroad and those selling properties they have inherited.
(5) The relationship between house prices and the household sector balance sheet depends on the reason for the change in house prices. Over the past ten years, it is likely that the rise in house prices has been associated, among other things, with lower real interest rates, higher household incomes, and higher population growth.
(6) It is well known that households tend to underreport the value of their financial assets and unsecured debt in such surveys. As Campbell (2006) notes, 'it may be more unusual today for people to reveal intimate details of their financial affairs than to reveal details of their intimate affairs'. Redwood and Tudela (2004) examine the extent of underreporting in the British Household Panel Survey.

Chart 3 Household net financial wealth plus housing assets by age



Sources: 1995 and 2000: BHPS (2005): NMG Research survey and Bank calculations.

Chart 4 Household debt by age



Sources: 1995 and 2000: BHPS (2005): NMG Research survey and Bank calculations.

How the debt distribution affects the responsiveness of the economy to shocks

While the build-up of household debt has not been associated with a deterioration in the household sector's aggregate balance sheet, it may be that the changed distribution affects the responsiveness of overall spending to shocks. One way of assessing this is to use a standard model of household behaviour such as the life-cycle/permanent income model (Modigliani and Brumberg (1979)). This model assumes that households are forward looking and that it is optimal and feasible for them to smooth their consumption over time. In this model, what matters to households in determining their current consumption is their lifetime net wealth (including expected future labour income), not their gross balance sheet positions. In particular, more indebted (but otherwise identical) households do not respond more to income shocks than other households, although they might respond more to interest rate and asset price shocks to the extent that these are exacerbated by leverage.(1)

In this model, higher debt levels therefore have only limited relevance for aggregate household sector behaviour. But many of the assumptions underpinning the basic life-cycle/permanent income model may not hold in practice. For example, all households are assumed to be able to foresee the future perfectly and to behave in a perfectly rational way. That affords no role for the possibility that some households might be ineffective at making saving plans and so might be prone to take on more debt than they can afford to repay, given their circumstances. If such a tendency were widespread, then the basic model could be misleading. However, recent evidence suggests that the proportion of households having debt repayment difficulties has been quite low in recent years (Waldron and Young (2006)).

Another assumption underpinning the basic model is that households are able to borrow against their future income. But theory and evidence has confirmed that there are limits to this. One reason is that capital market imperfections can arise because of frictions such as the inability of lenders to enforce financial contracts (Hart and Moore (1994)), asymmetric information between borrowers and lenders (Stiglitz and Weiss (1981)), moral hazard (Holmstrom and Tirole (1997)) and costly state verification (Bernanke, Gertler and Gilchrist (1999)).(2) In essence, these models imply that lenders are less willing to lend unless they can access collateral in the event that the borrower defaults.

One implication of this is that there are differences between the cost of secured and unsecured debt. Secured debt is generally available to households with a verifiable income stream up to some proportion of the value of their collateral, at interest rates only a little higher than the rates they can earn on deposits.(3) But borrowing more than can be secured on collateral is usually only possible at higher unsecured rates. Del-Río and Young (2006) use a life-cycle model to show that a collateral constraint affects the response of household consumption to different types of shock and so modifies the relationship between spending and the balance sheet. In particular, income shocks are likely to be smoothed over the life cycle by unconstrained households, as in the benchmark

(1) To see that consider two households; one with a mortgage of £100,000 on a £200,000 house and one with a £100,000 house owned outright. Both households have a net asset position of £100,000. Now suppose that house prices fall by 10%. The first household now has a house worth £180,000 and net assets of £80,000, while the second household has a house and net assets worth £90,000. Leverage or gearing has made the first household more exposed to asset price changes. An analogous argument can be made with respect to changes in interest rates. Of course, a fall in house prices would not necessarily reduce a household's lifetime wealth because it would also imply lower future housing costs. See Benito *et al* (2006).
(2) These imperfections are discussed in more detail in Haldane *et al* (2004).
(3) Hancock and Wood (2004) use evidence from the Survey of Mortgage Lenders to document trends in the distribution of loan to income and loan to value ratios for new borrowers.

case, but less so by households close to the collateral constraint. Because households without collateral face a higher cost of intertemporal consumption smoothing, they will do less of it, and when they receive a shock to current income, they will react more to it in the current period. Lower spreads on unsecured debt affect the extent to which households without collateral respond to shocks. The lower are the spreads, the more their behaviour will mimic that of those who are unconstrained.

So, to the extent that higher debt levels are a reflection of a mature financial system with fewer restrictions on borrowing, higher levels of debt might be associated with households finding it easier to smooth their consumption in the face of shocks. That would tend to reduce the responsiveness of the economy to shocks.(1)

Evidence

There is substantial evidence that households do not smooth their consumption to the full extent implied by the life-cycle/permanent income model. For example, Johnson, Parker and Souleles (2006) find evidence that many US households did not adjust their spending in response to the 2001 tax rebate until that rebate had been received, even though it was announced some time in advance. Stephens (2006) finds similar behaviour among UK households, whose consumption tends to be excessively sensitive to the timing of pay cheque receipts. Benito and Mumtaz (2006) find, using evidence from 1992 to 2002, that 20%–40% of UK households behaved as if they were constrained — either because of credit constraints or precautionary saving. This is somewhat higher than the 16% of British households who said they were credit constrained in the 2006 NMG Research survey (Waldron and Young (2006)).

All of this would suggest that income, interest rate or asset price shocks could have larger effects on spending than indicated by the basic life-cycle model. But is there evidence that those with more debt respond more?

One way of assessing that possibility is to examine the response of household-level spending to unexpected changes in financial circumstances. In particular, using the BHPS it is possible to compare a household's view of how its financial situation changed over the past year with what, one year previously, it said it expected for that year. This indicator provides a measure of whether a household had a positive or negative shock over that year. It is then possible to test how this affected the household's spending and whether the effect is larger for those with more debt.(2)

Table A shows the percentage of households in the sample reporting a worse, similar, or better financial situation than expected summed across each year between 1997 and 2004.(3) The rows indicate how a household expected their financial situation to change and the columns indicate how their financial situation actually did change. For example, the cell in the second column and first row shows that 3.2% of households reported their financial situation as 'about the same' as the previous year, having expected their situation to worsen.

Table A Frequency of shocks to households' financial situations from the BHPS

Per cent

		How situation turned out		
	Frequency	Worse off	About the same	Better off
How situation expected to turn out	Worse off	4.8	3.2	1.3
	About the same	11.6	39.6	12.8
	Better off	4.6	9.3	12.8

Sources: BHPS (1997–2004) and Bank calculations. 32,502 observations.

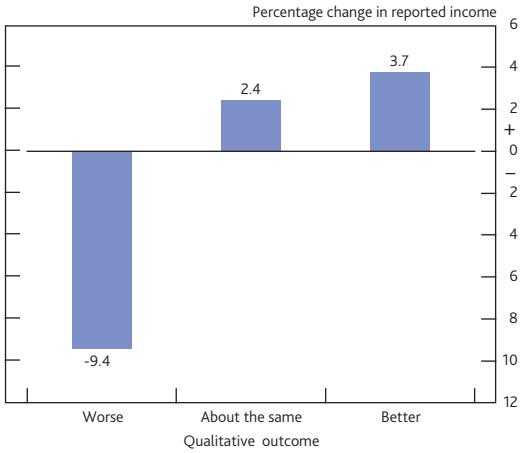
Questions: 'Looking ahead, how do you think you will be financially a year from now? Will you be: better off, worse off, or about the same?'. 'Would you say that you yourself are better off or worse off financially than you were a year ago?'.

A household's perception of how its financial situation has changed is a subjective, qualitative indicator. It is important to check that this is consistent with quantitative information provided by households. **Chart 5** plots the income growth averaged over each year between 1997 and 2004 of those who had expected their financial situation to get worse in that year. On average, income fell by around 9% for those whose financial situation actually got worse, as expected. Income grew by just over 2% for those who reported their financial situation to have been unchanged. And, income grew on average by just under 4% for those whose financial situation unexpectedly improved. This suggests that the financial shock indicator contains information as it is likely to encompass income shocks.

By splitting the sample according to whether a household is in the top quartile of mortgage debt or not, it is possible to investigate how debt levels affect households' durable spending in response to shocks to their financial situations.(4) According to the life-cycle/permanent income model, the size of the response is likely to be affected by whether these shocks are perceived to be temporary or more persistent. But even temporary shocks can be expected to have some effect on durables spending. **Chart 6** shows, as might be expected, that

(1) See Campbell and Hercowitz (2005) and Dynan, Elmendorf and Sichel (2005) for discussions on the contribution of financial innovation to the improvement in macroeconomic performance in the United States in recent years.
(2) This is a valid test provided that the shock indicator is not correlated with the debt position.
(3) This is the longest sample period available for an analysis of spending on consumer durables: the first BHPS survey was conducted in 1991, but questions on the amount spent on consumer durables were not asked before 1997.
(4) The set of durable goods covered by the BHPS is restricted to televisions, video recorders, freezers, washing machines, tumble dryers, dishwashers, microwave ovens, home computers and cd players.

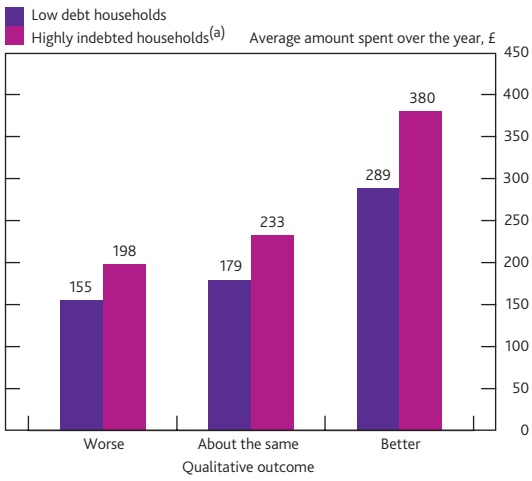
Chart 5 Reported change in income of those whose financial situation was expected to get worse



Source: BHPS (1997–2004).

of those who expected their financial situation to get worse, those who experienced positive shocks spent more on durables than those who did not. That is true for both the high and low debt groups. But the percentage amount by which spending is higher is hardly different for the low and high debt groups. Spending on durables is about 15% higher when they had a small positive shock (financial circumstances turned out the same when they had been expected to get worse) and about 90% higher when they had a large positive shock (financial circumstances improved when they had been expected to get worse).

Chart 6 Average spending on durables of those whose financial situation was expected to get worse



Source: BHPS (1997–2004).

(a) Highly indebted households are those in the top quartile of the mortgage debt distribution. The remaining households are defined as having low debt.

A similar conclusion emerges from an investigation of the spending of those experiencing negative shocks. Of those who expected their financial situation to improve, those who experienced negative shocks spent less on durables than those who did not. But there appears to be no material difference in the reaction of those with high or low debt. Those experiencing large negative shocks (their financial circumstances worsened when they were expected to improve) spent around 20% less whether they had high or low debt. Among those experiencing small negative shocks (financial circumstances unchanged when they had been expected to improve), those that had relatively low levels of debt actually reduced their durables spending (19%) by a little more than those with higher levels of debt (11%).(1)

Overall, this analysis of household-level data over 1997–2004 suggests that higher debt levels did not, in general, raise the sensitivity of spending to shocks: the response of those with more debt was similar to that of those with less debt. This implies that having a high level of debt over this period did not make it more difficult to adjust to shocks. This conclusion is consistent with evidence suggesting that households could reduce the extent to which they cut spending by responding to shocks in other ways. Benito (2007) finds that adverse shocks raise the likelihood of households withdrawing equity from their home. The evidence in Bridges, Disney and Gathergood (2006) and Del-Río and Young (2006) is consistent with households using unsecured borrowing to smooth over shocks. Also, in contrast to the basic life-cycle model that assumes that income is perfectly predictable, and to the extent that labour market conditions allow, households may have responded to shocks by increasing labour supply, either by additional members of the household going out to work (Attanasio *et al* (2005)) or by taking on a second job (Boheim and Taylor (2004)).(2)

The 1997 to 2004 period may be unusual in that households might have had multiple channels available by which they could smooth out shocks. In addition, the UK economy was historically very stable over this period (Benati (2005)). This meant that the shocks experienced were mainly idiosyncratic, affecting individual households in isolation, rather than the economy as a whole as in the early 1990s. There is evidence from other periods and other countries that responses to shocks have been larger when indebtedness was higher (Balke (2000)). An implication of this is that the response of the economy to shocks varies over time depending on the circumstances. Moreover the effect depends on the types of shocks that occur. For example, the years from 1997 to 2004 contained smaller interest rate movements and lower variation in unemployment than at other times. Had larger interest rate movements or more incidences of unemployment

(1) Further analysis using more formal econometric techniques that control for other influences on spending confirm the lack of any significant difference between the durables spending of high and low debt households.

(2) It seems that this is how Winston Churchill responded to debt problems: 'Churchill evolved two firm rules which he followed faithfully for the rest of his life. The first was that expenditure should be determined by needs (generously interpreted) rather than by resources. He stood the famous maxim of Dickens's Mr Micawber on its head. Second, he decided that when the gap between income and expenditure became uncomfortably wide the spirited solution must always be to increase income rather than to reduce expenditure'. Jenkins (2001, page 28).

occurred, it is possible that larger changes in spending would have been seen among those with more debt.

The response of households to interest rate shocks

Is it likely that the overall response of household spending to interest rate changes would be larger than in the past because of higher debt levels? This section outlines the various channels by which an unexpected increase in real interest rates would affect households.

The most obvious direct effect of higher real interest rates is that interest payments rise for those households who have flexible rate mortgages and other debts. This effect is equivalent to a fall in real income for these households and they would be expected to reduce their spending in response. For a household with debts of three times its income, for example, an increase in real interest rates of 1 percentage point sustained for a year would reduce its real income in that year by 3%. But the effect on spending would be less than this for those households who are able to spread the loss in real income over their lives.

For every borrower there is also a lender, so adverse income effects on borrowers will be at least partly offset by beneficial income effects on lenders.(1) But Bean (2004) notes that the impact of interest rate changes on demand may be affected by higher debt levels if indebted individuals respond more strongly to a rise in their interest payments than do savers to a corresponding rise in their interest receipts. It is often believed that the propensity to cut spending by borrowers is larger than the propensity to increase spending by lenders. But this belief may reflect the prevalence of borrowing restrictions in the past that prevented borrowers, but not lenders, from smoothing the effects of interest rate shocks. In the current conjuncture, where many households have greater capacity than before to increase borrowing through housing equity withdrawal, the spending responses of borrowers and lenders may be more similar, consistent with the empirical evidence reported earlier.

Other direct channels by which changes in real interest rates affect spending reflect substitution effects. First, through intertemporal substitution: higher rates increase the return to saving today to finance future spending.(2) Second, through intratemporal substitution: higher rates increase the opportunity cost of durable goods and housing and so discourage spending on them. There is no obvious reason to expect the intensity of these effects, which depend on household preferences, to have changed markedly over time, except that households might now have more flexibility to vary their spending by borrowing.

There are a number of indirect channels by which higher real interest rates affect household spending. One of the more important is likely to be the effect through house prices. Other things being equal, higher interest rates would reduce the demand for housing and hence house prices. A lower value of housing assets would tend to reduce the spending of older households, but lower prices would be beneficial to younger households who are intending to buy a house for the first time or trade up (Benito *et al* (2006)). The net effect of this on aggregate spending would depend on the initial distribution of housing and variation in propensities to consume.

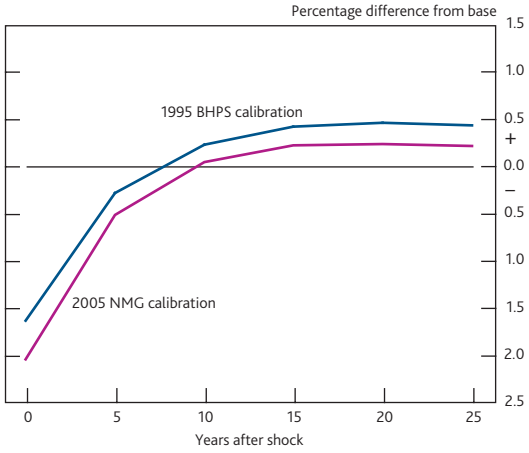
Putting all of these channels together and determining how consumer spending might respond to changes in real interest rates is not straightforward. One way of doing that is to use an overlapping generations (OLG) model of household behaviour similar to the life-cycle/permanent income model described above. In order to capture some of the important channels through which changes in interest rates can affect spending, the model incorporates collateral constraints on household borrowing and allows for endogenous changes in house prices.(3) The model is calibrated to UK data. By calibrating the age distribution of balance sheets to be the same as distributions from different waves of the BHPS and NMG survey data (see **Chart 3** and **Chart 4**), it is possible to examine how the initial distribution of debt and balance sheets affects the response of spending to changes in real interest rates.

Chart 7 plots simulated responses from the OLG model of consumption to an exogenous, unexpected 1 percentage point increase in real interest rates. It is assumed that the increase persists for around five periods (each period is of five years) but eventually wears out.(4) Because the model periods are so long, the simulations are not designed to quantify the impact of monetary policy changes. For example, they do not provide a read as to how consumer spending might have responded to the three increases in Bank Rate since August 2006. Instead, they are designed to give an indication of how changes in the distribution of balance sheets and debt might have affected the response of spending to changes in policy. In both cases, the simulations show the percentage change in consumption after the increase in real interest rates relative to what it would have been had interest rates remained unchanged. In the first case, the initial distribution of balance sheets (debt and financial wealth) and housing assets is set equal to that from

(1) Some of the direct beneficiaries of higher interest receipts may be outside the household sector. While the household sector's stock of financial assets is worth considerably more than its stock of debts (**Chart 1**), much of this is held indirectly in pension funds. Direct interest receipts of the household sector as a whole (£31.4 billion in 2005) are much smaller than interest payments (£71.0 billion).
(2) More formally, changes in real interest rates have substitution, income, and human capital or wealth revaluation effects. See, for example, Deaton (1992).
(3) This model extends that of Tudela and Young (2005) by incorporating collateral constraints, bequests and endogenous house prices.
(4) The real interest rate is 1 percentage point higher for the first five years, 0.5 percentage points higher for the next five years, 0.25 percentage points higher after ten years, 0.125 percentage points higher after fifteen years, etc. Because the model is forward looking, the expected future path of interest rates affects current spending decisions. This makes the assumed persistence of the shock important.

the 1995 BHPS survey. In the second, the initial distribution is set equal to that from the 2005 NMG survey.

Chart 7 OLG model: simulated response of the level of consumer spending to a persistent 1 percentage point rise in real interest rates



In both simulations, consumption falls in the first period, reflecting the operation of the channels described above: the decline relative to base is around 2% with balance sheets as in 2005 and about 1.6% with balance sheets in 1995 when indebtedness was lower. This reflects the stronger effects of interest rates on spending when debt levels are higher, as in the 2005 NMG Research survey.

How debt levels affect the underlying dynamics of the economy

Greater levels of household debt may also affect the underlying dynamics of the economy and accentuate its cyclicality through 'financial accelerator' effects. An example of how these effects work would be if higher house prices strengthened borrower balance sheets and thereby encouraged lenders to extend more credit or do so more cheaply, so that house prices rose further. Large (2004) makes the point that the relationship between debt and asset prices may accentuate the size of cyclical fluctuations in spending: 'Increases in house prices and secured debt have tended to reinforce each other. If either has 'overshot' — for instance, because of unrealistic expectations of income growth — the other is likely to have overshot too'. Shin (2006) provides a more formal analysis of these interactions.

While such interactions between borrower and lender balance sheets *could* be important, it is not clear that they have been in recent years. For example, household spending might have been affected by changing credit conditions, but such effects have been quite gradual and modest. Similarly, there is evidence that balance sheet or liquidity problems among the banks could cause them to tighten conditions in the future. But again, the current financial position of leading lenders in the United Kingdom suggests that this is unlikely to be a problem at the moment (Bank of England (2006a)). Nevertheless, Irving Fisher's analysis of debt deflation in the 1930s and more recent evidence from Japan emphasises the potential difficulties that can be caused by the interaction of borrower and lending balance sheet problems. Moreover, Tucker (2003) notes that should balance sheet difficulties occur in the United Kingdom, the subsequent adjustment 'would complicate the operation of monetary policy in ways that are hard to anticipate. It will not do to argue that faced with such retrenchment, the Bank could reduce interest rates, since we do not know very much about how much purchase monetary policy would have in such circumstances'. This emphasises the potential difficulties these interactions would cause should they occur and the reasons for continuing to monitor household and lender balance sheets.

Conclusion

Overall, it would appear that there are enough buffers on both the household and lender balance sheets for the build-up of household debt not to complicate the operation of monetary policy in the current conjuncture. But there is no guarantee that this situation, where balance sheets seem likely to have played a largely passive role in the medium-term evolution of the economy, will persist. Larger shocks than seen recently, particularly shocks impacting on interest rates, income or employment, could cause adverse interactions between debt, house prices and consumption. Assessing the possible effects of such shocks can be assisted by models such as the modified life-cycle model outlined earlier. But there is also a continuing need to monitor balance sheets of both borrowers and lenders so that developing problems can be anticipated and addressed. In recent years, the Bank of England has commissioned surveys of household balance sheets precisely for this purpose. It has recently announced plans to introduce a systematic survey of lenders to supplement the information gained from its regular liaison activities (Bank of England news release (2006b)). Careful analysis of this information will be vital in assessing the role that household debt plays in the future evolution of the UK economy.

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Gauging capacity pressures within businesses

By Colin Ellis and Kenny Turnbull of the Bank's Monetary Analysis Division.

This article discusses the measurement of capacity pressures within businesses — a key influence on the outlook for inflation. The degree of pressure on capacity relative to normal is likely to affect businesses' costs and prices. A variety of different methods are presented, each with their own advantages and drawbacks. Ultimately, no measure of capacity pressure is perfect, and the policymaker's judgement is crucial.

When setting interest rates, the Monetary Policy Committee (MPC) focuses on the outlook for CPI inflation in the medium term. One influence on CPI inflation in the short to medium term is the degree of capacity pressure in the economy. This article focuses on how this capacity pressure can be estimated, using several different techniques. Of course the degree of capacity pressure is not the only factor that will influence inflation in the short to medium term. While capacity pressure captures the balance of demand and supply in the product market, the degree of slack in the labour market will also influence inflation, as will movements in the terms of trade.

What are capacity pressures?

Put simply, the degree of capacity pressure faced by businesses — often referred to as capacity utilisation — reflects the intensity of production, or how 'hard' businesses are working their factors of production. Capacity pressure measures the balance between actual output and how much output companies would produce if their equipment (capital) and workers (labour) were employed at their normal intensities.(1) Capacity utilisation therefore depends not just on how much demand there is for market sector output, but also on companies' production techniques — how they use capital and labour to make that output.

Rises in capacity pressure are likely to be fairly short-lived: if a company faces persistently strong demand, it is likely to respond by hiring more workers or investing in new capital equipment, thereby increasing its 'normal' capacity. Similarly, if businesses experience persistently weak demand they may cut back on labour or investment. But in the short term, it may be difficult or costly for companies to change their capital stock or the number of employees. As a result, changes in demand are likely to be reflected by movements in capacity utilisation, at least in the short term. In addition, if businesses have a degree of pricing power they may take advantage of stronger demand to raise prices, thereby limiting the responsiveness of output to the stronger demand. But this may not be sustainable in the longer term, due to price competition from other businesses.

How do capacity pressures affect inflation? When utilisation is above normal workers are likely to be working harder, by putting in longer hours or more effort. Those workers will expect to be paid accordingly, for example through overtime pay, which is often higher than normal pay rates. At the same time, companies may respond to strong demand by using equipment more intensively — with the result that the costs of maintaining that equipment are likely to rise and/or the equipment will depreciate more quickly.

As a result of these factors, higher capacity utilisation is likely to go hand in hand with diminishing marginal productivity — that is, as utilisation rises it is likely to result in smaller and smaller increases in production.

So when capacity utilisation rises, companies tend to face higher costs. This implies that the marginal cost of production — that is, the cost of producing an extra unit of output — rises with the degree of capacity pressure. This rise in marginal cost will tend to put upward pressure on businesses' prices. As such, if businesses are working harder than usual — capacity pressure is above normal — there is likely to be upward pressure on prices and hence inflation.

How can capacity pressures be measured?

There are several different ways of gauging the degree of capacity pressure in the economy. This article examines three

(1) Note that capacity pressure does not directly incorporate slack in the labour market, or the difference between actual and potential employment. Barwell *et al* (2007) describe the determinants of potential employment.

broad types of measurement: models of production; statistical filtering; and business surveys.

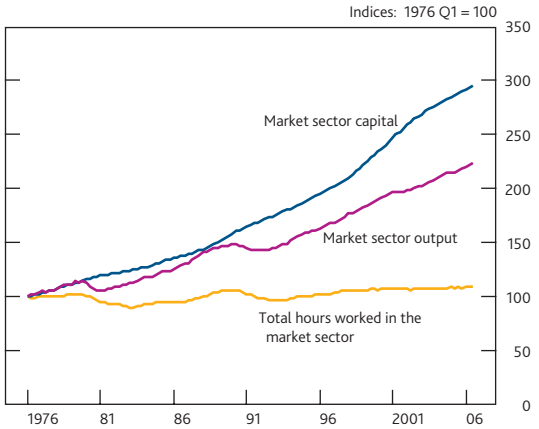
Using models of production to gauge capacity

Capacity utilisation reflects the balance between demand and supply in the economy — what companies are actually producing, and what they would 'normally' produce given the people and equipment that they employ. So one way to measure capacity pressures is to look at output data, and try to separate sustainable rises in output — often called 'trend' increases in output — from rises that reflect utilisation.

One way to do this is to use measures of companies' capital and labour — their inputs to production — to estimate how much output those factors would normally produce.

Over the past 30 years, capital has tended to rise at a faster pace than market sector output, while total hours worked in the market sector have risen at a slower rate, as increases in employment have been offset by falls in average hours worked (**Chart 1**). The capital series in **Chart 1** measures the productive flow of services from capital, rather than the asset value of the capital stock: the former is more relevant for calculating production capacity (see Oulton (2001)). Importantly, to gauge how much output these resources could normally produce, some assumptions need to be made about production. The basic tool economists use is the production function, which describes how capital and labour are combined to produce output.

Chart 1 Output, capital, and hours worked in the market sector



One key feature of production is companies' ability to swap between capital and labour in production — the elasticity of substitution in production. A common assumption is that this elasticity of substitution is equal to one (Cobb-Douglas).(1) However, previous work suggests that the elasticity of substitution is probably lower than unity in the United Kingdom: most estimates range from around 0.3 (see Harrison *et al* (2005)) to around 0.5 (see Barrell and Pain (1997)).(2)

Apart from the elasticity of substitution, it is also important to consider technological progress. Typically, when a production function is estimated on actual output data, it suggests that output has risen by more than can be accounted for by measured changes in capital and labour. Part of this could reflect measurement issues.(3) But, even when these are considered, some unexplained rise in output normally remains. This is called 'total factor productivity' or 'multi-factor productivity'.

These productivity measures tend to rise over time. So in order to gauge capacity pressures from them, the measures are separated into temporary and permanent components. The permanent component is often ascribed to technical progress — that is, increases in the efficiency with which companies combine capital and labour to make output. Technical progress is frequently assumed to be constant — and so efficiency is assumed to rise in a straight line.

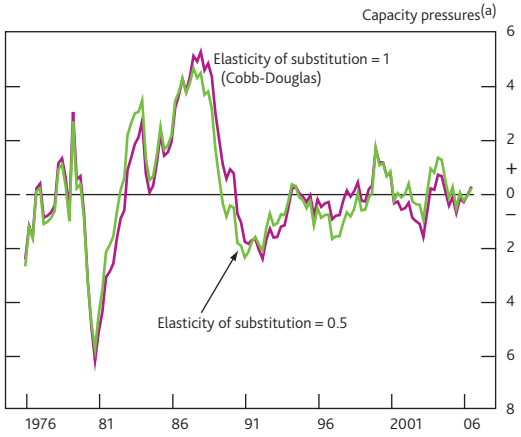
Equipped with all these factors — labour, capital, technical progress and the elasticity of substitution — a production function can be used to gauge the evolution of 'normal' supply capacity. The difference between actual output and this measure of normal capacity is then a measure of capacity utilisation.

Before doing this it is important to consider which concept of output to use. Often, measures of capacity are calculated using data on GDP. But GDP includes public sector output. And, quite apart from the measurement difficulties that arise when measuring public sector output, capacity pressures in the public sector are unlikely to have direct implications for CPI inflation, which applies mainly to the prices of market sector goods and services. So the relevant measure of capacity pressure within businesses should relate to the market sector, rather than the economy as a whole.(4) Of course, there may still be implications for inflation from public sector activity, which arise via the labour market (see Hills *et al* (2005)).

Chart 2 shows two measures of capacity utilisation, based on two different elasticities of substitution. The measures broadly track each other over time. This is because the implied time trends (proxying technical progress) will differ depending on the elasticity of substitution. Over a long period of time, this difference in technical progress broadly accounts for the difference in how capital and labour affect capacity.(5)

(1) This implies that a 1% fall in the price of capital relative to labour is matched by a 1% increase in the amount of capital used in production relative to labour (and *vice versa*). For more information on the elasticity of substitution in the United Kingdom see Ellis and Groth (2003).
(2) Chirinko *et al* (2004) estimate an elasticity of 0.4 for the United States.
(3) For example the measurement of labour skills: see Groth *et al* (2004).
(4) For more details on this measure see Churm *et al* (2006).
(5) Larsen *et al* (2002) describe a more complex model-based approach to gauging technical progress and utilisation rates.

Chart 2 Measures of utilisation based on production functions



(a) Percentage deviation of output from estimated 'normal' capacity.

These production-based measures of utilisation are subject to a great deal of uncertainty, not least about the measurement of capital, labour and technical progress. In particular, the assumption that technical knowledge advances at a constant rate is likely to be unrealistic. Indeed, research suggests that the rate of technical progress does indeed vary over time.(1) So considering alternative ways of measuring capacity pressures where technical progress can (potentially) vary is also important. The production function approach could be adapted to incorporate time-varying technical progress, although that time-varying behaviour would have to be determined somehow.

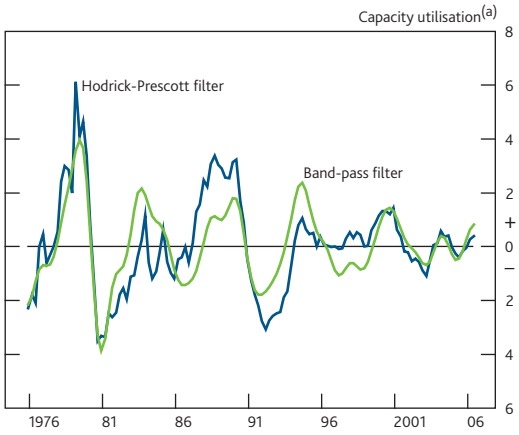
A statistical approach: filtering output data

The previous section described how capacity utilisation can be measured by focusing on the inputs companies use in production. But these inputs may be mismeasured: for example, capital services data depend on a variety of assumptions about depreciation. So examining alternative approaches, such as using statistical filters, may be useful.

Essentially, a statistical approach takes the output data described earlier and plugs it into a statistical filter — typically a smoothing mechanism. This 'smoothed' measure of output is then a proxy for normal capacity — once again, the difference between actual output and this smoothed measure is the measure of capacity utilisation. The logic for this approach is based on the earlier observation that short-term changes in demand are likely to be reflected in capacity utilisation and also that businesses typically find it difficult to adjust their factors of production in the short run. So 'normal' supply capacity should be less volatile than output, or alternatively sustainable (or 'trend') increases in output should be smoother than actual changes. However, those sustainable increases in output could vary over time, unlike the 'constant rate' technical progress measures described earlier.

There are many types of statistical filters, but two of the most commonly used are the Hodrick-Prescott (HP) and band-pass (BP) filters. The HP filter basically 'smoothes' data by calculating a moving average of the time series. The BP filter is a little more subtle, and is based on the notion that time series can be divided into components of different frequency: very slow-moving components, intuitively associated with the notion of a trend; fast-moving ones, associated with 'noise', or seasonal factors; and components that are between these two, which are often associated with the business-cycle fluctuations.(2) **Chart 3** shows measures of capacity utilisation based on these two filters.

Chart 3 Measures of utilisation based on statistical filters



(a) Percentage deviation of market sector output from filtered trend.

Of course, these measures are very uncertain, just like those based on production functions. These types of filters tend to produce a 'smoothed' series that is very close to the original series at the end of the time series, often known as the 'end-point' problem. For monetary policy makers, where the latest data are particularly important, that is a key concern. The implicit assumption that 'normal' supply is less volatile than demand will attribute any sudden change in output to utilisation, even if the change in output actually corresponds to a change in supply capacity.

Indeed, one strand of the literature has suggested that fluctuations in output growth may not reflect deviations in output from its potential — or capacity utilisation from normal.(3) Instead, changes in output growth could reflect an equilibrium response of the economy to real shocks, such as changes in potential supply, rather than companies working harder than usual. The production function and filtering approaches to measuring capacity pressure would then be misleading, as they would not allow for sudden changes in supply.

(1) See for example Kydland and Prescott (1982) and Ellis (2006).
(2) For more information on this filter, see Christiano and Fitzgerald (2003).
(3) See Kydland and Prescott (1982) and Hall (2005).

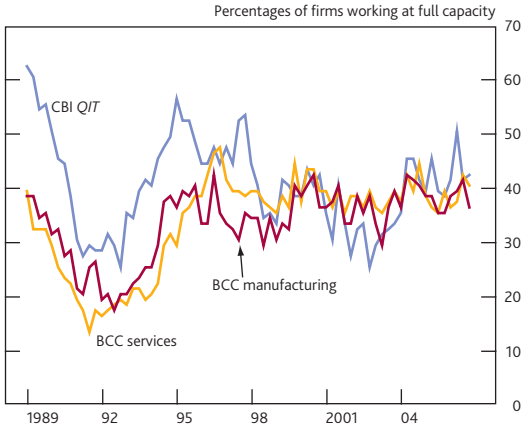
However, other work has shown that changes in output growth, at least in the short term, are more likely to be driven by demand shocks than supply shocks: see Blanchard and Quah (1989). This suggests that, over time, potential supply is less volatile — smoother — than demand, as embedded in both the production function and statistical filter measurement approaches. But it is still possible that supply capacity could change more suddenly than these measures assume, which could cause them to be misleading.

Measuring capacity pressures using business surveys

Capacity utilisation is clearly hard to measure using official data. One alternative is to look at other sources of information, in particular evidence from surveys.

Some surveys ask businesses directly whether they are operating at full capacity. Two of the best-known surveys that ask about capacity are the British Chamber of Commerce's (BCC's) *Quarterly Economic Survey*, and the CBI's *Quarterly Industrial Trends* (*QIT*) survey. **Chart 4** shows the capacity balances from these surveys.

Chart 4 Survey measures of capacity utilisation



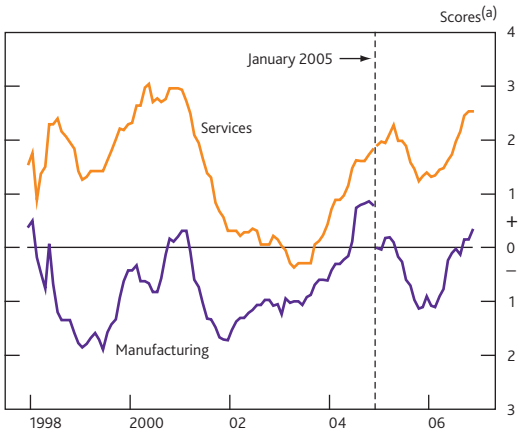
Sources: BCC and CBI.

There are also other data available on capacity pressure. As part of their regular reporting on economic conditions, the Bank's regional Agents produce a set of quantitative 'scores', which give a guide to conditions in the economy.(1) These include scores on capacity pressures in the manufacturing and service sectors (**Chart 5**).

Other surveys can also be informative. The CBI/Grant Thornton *Service Sector Survey*, and the CBI/PWC *Financial Services Survey*, do not include questions that directly ask about capacity pressure. But they do ask about how current demand compares to normal demand (**Chart 6**). If we assume that businesses set 'normal' capacity to meet 'normal' demand, then these questions can also provide information about capacity pressures in parts of the economy.

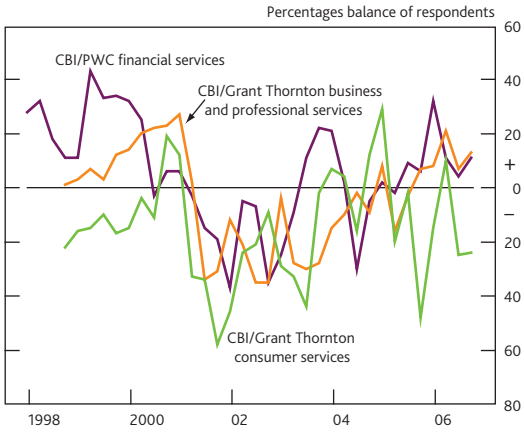
In addition, we can glean something from the CIPS/RBS *Report on Services*. This survey does not include a capacity utilisation question, or one on demand relative to normal. But it does include a question on changes in outstanding business, defined as work placed but not yet completed (**Chart 7**).

Chart 5 Agents' scores for capacity pressures(a)



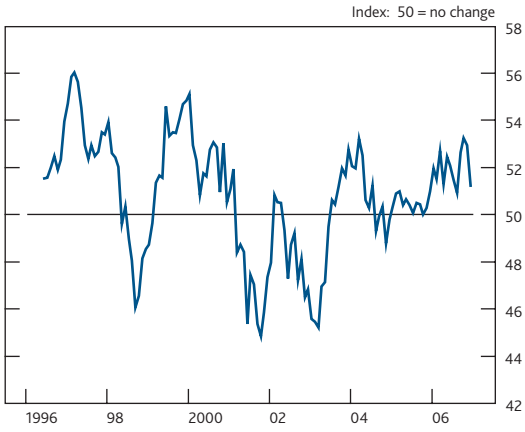
(a) A score of +5 indicates severe capacity pressure; a score of -1 indicates pressures are a little lower than normal. Prior to January 2005, the scores were based on current capacity utilisation relative to normal. Since January 2005, they relate to capacity constraints over the next six months.

Chart 6 Survey measures of demand relative to normal



Source: CBI.

Chart 7 CIPS/RBS outstanding business in the service sector



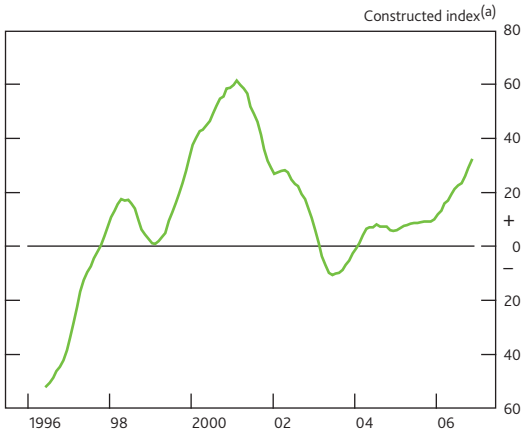
Source: CIPS.

(1) See Ellis and Pike (2005).

This outstanding business index tells us about the balance between demand and supply, and hence capacity utilisation. When outstanding business is rising, demand is running ahead of supply, and so capacity utilisation will be rising. But when outstanding business is falling, demand is running behind supply: so capacity utilisation will be falling. Adding up the consecutive changes in outstanding business[1] yields an indicator of capacity pressure. In order to derive the indicator, it is also necessary to set a reference date corresponding to a period where capacity pressure is close to normal. This can be gauged from other surveys.

The resulting CIPS/RBS-based index is shown in **Chart 8**; it indicates a peak in service sector capacity pressure around 2001, followed by a subsequent fall and more recent pickup. This is broadly consistent with other surveys (eg **Chart 5**). So the CIPS/RBS survey can also provide a gauge of capacity pressures in the service sector.

Chart 8 A capacity measure based on CIPS/RBS outstanding business



Sources: CIPS and Bank calculations.

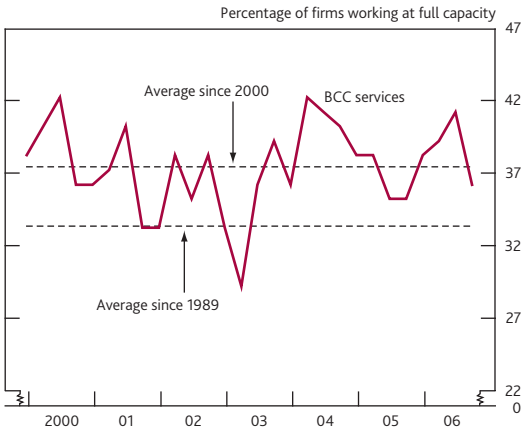
(a) Reference date where index is zero is March 2004, based on other services surveys (BCC, CBI/PWC, CBI/Grant Thornton and Bank's regional Agents' scores) being near their averages since 1999.

More generally, the issue of what level to 'benchmark' survey evidence against is important — it determines whether pressures are judged to be higher or lower than normal. This issue is related to the question of whether production function or statistical models incorrectly attribute changes in output to utilisation, rather than a sustainable change in 'trend' productivity. Crucially, in order to determine whether capacity pressures are higher than normal, we need some gauge of what 'normal' is. The production function approach determines this using the measured factor inputs and the assumption about constant technical progress. The statistical filters essentially impose that 'normal' capacity levels are smoother than actual output. But what benchmark of normal is appropriate for survey evidence?

One gauge of 'normal' would be to take an average of the series. But that average could be sensitive to the sample period. By choosing an average over a long period, its sensitivity to any particular data point or any single economic cycle is reduced. But it may be more appropriate to focus on the average measure over a shorter time period, for example if 'normal' capacity usage has changed. Evidence from contacts of the Bank's regional Agents suggests that companies have become used to working with smaller margins of spare capacity over the past ten years, partly because they are more able to 'flex' capacity. As such, comparing a capacity survey balance today to its average over the past 17 years may give a misleading picture of capacity pressures.

Chart 9 shows two averages for the BCC measure of capacity utilisation: one since the series began (1989), and the other since 2000. The two averages are very different — in particular, comparing the survey balance to the average taken over a longer time period suggests that capacity pressures have been above 'normal' for almost all of the past six years, associated with constant upward pressure on prices in the service sector. That is because the average it uses as a benchmark includes the marked fall in output in the early 1990s.

Chart 9 Capacity pressure in the service sector



Source: BCC.

Collating survey evidence

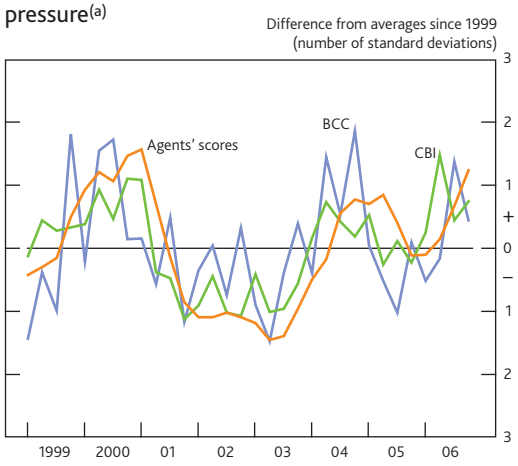
The previous section illustrated a number of capacity measures based on survey information. One option for summarising these data is to construct aggregate balances from each survey by weighting together the sectoral balances using output weights. The resulting balances are shown in **Chart 10**. All three measures suggest that capacity pressure peaked around 2001, and then fell back before rising in recent years.

An alternative approach to deriving economy-wide measures of capacity utilisation is to use statistical techniques to extract a common trend from the various sectoral surveys. Such techniques typically assume that each sectoral measure can be thought of as the sum of a common economy-wide

(1) In the CIPS/RBS survey, 50 is the benchmark 'no change' level. So this was subtracted from the CIPS series (the blue line minus the black line in **Chart 7**) before cumulating.

component, a sector-specific factor, and a measurement error. The assumption of a common trend across measures is given some support by the fact that sectoral surveys appear to move in broadly similar ways over time (see for example **Charts 4** and **5**). But there are different techniques for extracting such a trend, for example taking a linear transformation of data or using an estimated model. So it is important to cross-check these estimates against those produced using other techniques.(1)

Chart 10 Aggregate survey balance of capacity pressure(a)



Sources: Bank of England, BCC and CBI.

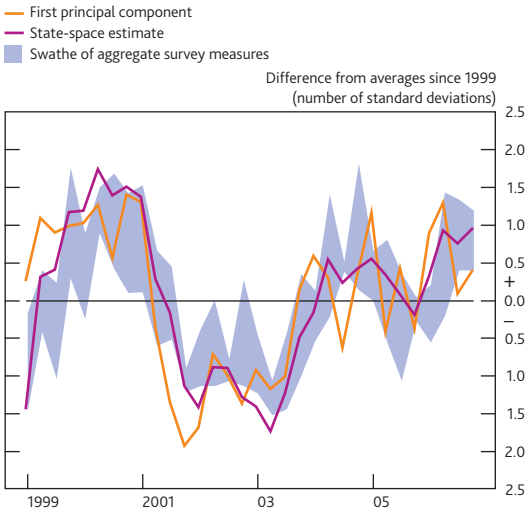
(a) The measures are produced by weighting together different sectoral surveys using nominal shares in output.

One technique for extracting common information from different series is called principal component analysis (PCA). PCA uses a linear transformation of the data series to identify the common component that underlie those different data series. Essentially, the technique 'chooses' a weighted combination of the different survey series so as to extract the most variable components from the data.(2) In this instance, there are nine different survey measures of capacity across all sectors: two from the BCC survey; four from various CBI surveys; one from the CIPS services survey; and two from the Bank's regional Agents. Using these nine measures, it is possible to generate the principal components using PCA.

Another means of gauging 'underlying' capacity pressure from the range of surveys is to use a state-space approach. State-space models allow unobserved variables — in this instance 'underlying capacity' — to be modelled using observed data, such as the survey measures. In practice such a model could take many forms — but for the illustrative purposes of this article a relatively simple model is used: each of the observed surveys is assumed to be the sum of the 'underlying capacity' measure and another unobserved component, which could vary across the different survey measures.(3)

Chart 11 shows the first principal component from the data series, and a state-space estimate of underlying capacity, together with a 'swathe' showing the range (minimum to maximum) of the aggregated whole-economy capacity measures in **Chart 10**. The principal component and state-space estimates match the swathe fairly closely. This suggests that the assumption underpinning the principal component and state-space measures — namely that each survey captures both economy-wide and sector-specific (or survey-specific) pressures — may not be unrealistic. The latest reads from all three measures in **Chart 11** suggest that capacity pressures may be a little higher than their recent average.

Chart 11 Different capacity measures based on survey data



Sources: Bank of England, BCC and CBI.

Conclusions

The degree of capacity pressure — essentially, how 'hard' companies are working — is a key influence on the outlook for inflation. Capacity pressure can be estimated using various approaches. This article has examined three different ways of measuring this capacity pressure, using: models of production; statistical filters; and survey evidence. Each approach has advantages and drawbacks, so it is important to look at a range of estimates. The estimates using these three different approaches have moved in a broadly similar way over time.

A common problem with this analysis is the risk of assigning a change in output to a change in utilisation, rather than a permanent change in supply capacity. But these methods can shed light on an unobservable — but key — element in the monetary transmission mechanism. As such, although no measure of capacity pressure is perfect, they are very important in helping policymakers form their own judgements.

(1) Astley and Yates (1999) describe a model-based approach to generating a capacity utilisation measure that combines information from output and survey data.
(2) For more information on PCA, see Jolliffe (1986).
(3) For more information about state-space models, see Greenslade *et al* (2003).

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Do announcements of bank acquisitions in emerging markets create value?

Summary of Working Paper no. 315 Farouk Soussa and Tracy Wheeler

The liberalisation of emerging financial markets (EFMs) in the mid-to-late 1990s paved the way for a marked rise in the number of emerging market acquisitions by banks in developed countries. This paper examines the net benefits of these acquisitions for the acquiring bank using an event-study methodology to indicate whether value was created by the merger. If the value of the acquiring bank increases following the acquisition then expansion into EFMs is considered to have had net benefits. The results show that acquisition announcements are generally associated with a loss in value for the acquirer, but this persists for only one week. Losses in value are found to have been greater during and immediately after the East Asian crisis but (i) the size of the acquisition, (ii) the region of the target, and (iii) whether the target is a bank or non-bank financial institution are found to have no impact. It should be noted that this study analyses the effects of acquisition only on the acquiring bank. Acquisitions in aggregate may still create value if the value of the target bank increases sufficiently as a result.

The fact that banks still make acquisitions in EFMs despite the resulting value losses found in this study presents a puzzle. Two explanations are offered. The first is that markets are not perfect, and hence that equity price movements do not reflect the full impact of the acquisition on future profits. The second is that there could be a so-called principal-agent problem, whereby managers have greater incentives to pursue EFM acquisitions than stockholders. While stockholders can benefit from any associated increase in profits, they also bear the full financial exposures associated with the acquisition. The managers, however, have less financial exposures and can improve their future wage prospects if the acquisition provides a positive signal to the labour market regarding their ability.

Financial infrastructure and corporate governance

Summary of Working Paper no. 316 Helen Allen, Grigoria Christodoulou and Stephen Millard

One of the core purposes of central banks is the maintenance of financial stability, which entails their detecting and working to reduce threats to the financial system as a whole. An essential part of the financial system is its infrastructure: for example, payment systems, securities settlement systems, central counterparties and messaging services. These enable transactions ranging from individual consumer payments through to transactions in both domestic international wholesale financial markets. Were any of these infrastructures to fail, the impact would affect the whole economy. Transactions might not be completed, or might be delayed, in turn hampering other transactions; problems in one area could spread rapidly beyond the original source. In other words, there is systemic risk in financial infrastructure. This threat to financial stability largely explains why central banks seek to ensure — via their 'oversight' role — that financial infrastructures take sufficient measures to mitigate risk.

In effective management of systemic risk, many aspects of the design and operation of an infrastructure play a role — among them, overall risk management (notably of credit, operational, liquidity and legal risks), the criteria for participation (defining which institutions can connect to the infrastructure) and system governance. This paper explores the role of governance of infrastructures in the management of systemic risk. If different governance arrangements of these infrastructures affect their incentives to mitigate such risk, then this should help overseers to advocate particular governance structures for financial infrastructures.

To analyse this question, we consider the case of a generic infrastructure provider operating under two different forms of ownership: owned by outside shareholders (and hence maximising profits); or operating as a mutual body of its users, following the arrangements commonly seen in the market for payment services. Intuitively, the mutual infrastructure provider may decide to commit more resources to risk mitigation, as it has a strong, direct incentive to avoid risks to its users' (and owners') own operations caused by problems in the infrastructure.

Nevertheless, from the perspective of the economy as a whole, this level of risk mitigation may still be inadequate. That is because the infrastructure provider may not take account of the infrastructure's malfunction on consumers in the wider economy. This is the disruption likely to be felt by individuals, households and companies very distant from the infrastructure's governance.

If a public authority wished to offset this underprovision of risk mitigation, there are several policies it could adopt. Along with the imposition of direct regulatory requirements, some combination of taxes, subsidies and disclosure standards are commonly considered in mitigating such problems. However, in practice we know there are cases where the information and policy levers to apply potential policies are lacking. In particular, policymakers may have few, if any, direct powers of enforcement over multinational infrastructures (which are becoming increasingly common).

Given that these 'traditional' ways of addressing inadequate risk mitigation might not be feasible in the case of financial infrastructure providers, particularly where these operate in many countries, we consider the alternative of placing external stakeholders on boards to act as 'guardians' of the public interest of systemic risk reduction. In effect, voting by these external stakeholders could re-weight the objectives of the firm to take into account any costs imposed on other sectors of an economy. There are, however, important caveats to this possibility — in particular, identifying appropriate individuals, designing their contracts and ensuring their voice is sufficiently recognised in the infrastructure's decision-making.

On balance, though, we conclude that external stakeholder representation may be a practical, first option in a limited toolkit. Even if formalised powers to address systemic risks in other ways ultimately came about, trying to maximise the results from this market-based route may at least offer a better starting point from which to take further decisions.

Corporate debt and financial balance sheet adjustment: a comparison of the United States, the United Kingdom, France and Germany

Summary of Working Paper no. 317 Peter Gibbard and Ibrahim Stevens

Two types of variables may help to explain corporate debt: those suggested by the 'trade-off' theory — the balance between the benefits of obtaining debt capital, such as the tax deductibility of interest payments on debt capital, and the costs of having too much debt, such as the likelihood of financial distress — and those suggested by the 'pecking order' theory — the preference for internal finance, such as retained profit, over debt capital and external equity financing. The 'trade-off' variables are those that determine the optimal level of debt — when the marginal benefit of obtaining debt capital equals to its marginal cost, variables such as the ratio of the market value to the book value (market-to-book ratio or value) of the firm. The pecking order variables are those that determine the immediate external financing needs of the firm. These variables include investment, acquisitions and cash flows.

This paper provides a comparison of the determinants of corporate debt in the United States, the United Kingdom, France and Germany. It uses a model which assesses the contribution of investment, acquisitions, cash flows and market-to-book values to the determination of debt, and also the tendency of debt to revert to its appropriate or optimum level. We obtain data from COMPUSTAT (Global) — a database of company accounts. While there is considerable previous work on the determinants of corporate debt, cross-country comparisons are relatively scarce. And few use the latest modelling techniques that are available.

The analysis in this paper takes a panel data approach — a method of examining data jointly for separate individuals and for a specific subject. We use autoregressive distributed lag equations — these equations take into account past behaviour of the regressed variable. First we estimated the equations for the total data set — the data set which included companies from all the countries. Debt was found to have a positive effect on the financing needs of the firm while the optimum level of debt had a negative effect on the market-to-book ratio. This casts some light on the procyclicality of debt. It suggests the growth of debt in a boom is explained by the increase in financing needs; and this more than offsets the fall in the optimum level of debt associated with the rising market-to-book value. The equations describing equity issuance reveal that financing needs are partly met by equity issuance, and thus are inconsistent with a pure version of the pecking order theory — which proposes that immediate financing needs are met only by debt issuance. Finally, debt has a significant negative coefficient in the investment equation, indicating that at higher levels of debt, external finance becomes more difficult to obtain.

Second, equations were estimated for the individual countries, and the following three facts emerged. First, German investment appears to be the most dependent upon external finance — both debt and equity — and French investment the least dependent. Second, the sensitivity of debt to investment and acquisitions is greatest in Germany and the United States. Third, Germany and the United States tend to be slower to pay down their debt. So, in a boom, German and US debt might tend to rise above the optimum level by more than in the United Kingdom and France, responding to the higher levels of investment and acquisitions. And in a slowdown, when adjusting back down to the optimum, German and US debt tends to be paid down more slowly.

There are a number of different ways in which debt may be affected by the market-to-book ratio. For example, one version of the trade-off theory posits an effect due to the relationship between default risk and debt; another version an effect due to the relationship between 'growth opportunities' and debt. To isolate the effect on default risk on debt, we supplement our US data set with time series of Standard and Poor's credit ratings. A new version of the model for debt is then estimated, replacing the market-to-book ratio with credit ratings. We find that ratings downgrades do tend to reduce debt, although the strength of this relationship (the coefficient) is significant only at the 10% level.

Does Asia's choice of exchange rate regime affect Europe's exposure to US shocks?

Summary of Working Paper no. 318 Bojan Markovic and Laura Povoledo

The extent to which Asia's choice of exchange rate regime affects Europe's exposure to US shocks is a pertinent issue to examine at present for two reasons. First, a number of commentators have suggested that the United States' large current account deficit is unsustainable and will likely decrease (perhaps caused by shocks in the United States). Second, the authorities in China, the largest Asian economy, have made a number of suggestions over the past year that they might allow greater flexibility in the exchange rate movements of the renminbi.

We use a three-country model, calibrated for the United States, Europe, and Asia, to analyse the effects on Europe of US shocks, and compare two cases: (1) when the currency of the Asian bloc is pegged to the US dollar; and (2) when the Asian currency freely floats against both the US and European currencies.

The following example explains why shocks in the United States can affect demand for European output. First, any shock that raises US consumption, increases US demand for worldwide, and thus Europe's output. Aggregate demand for Europe's output is further affected by the consequent reaction of consumption in Europe and consumption in Asia. Second, demand for Europe's output depends not only on world consumption, but also on the allocation of consumption across countries, because households are biased towards consuming domestic products. Hence, a unit increase in consumption in Asia has a different effect on demand for Europe's output than a unit increase in consumption in Europe. Third, the allocation of consumption over time (usually known as consumption smoothing) also affects the demand for Europe's output over time. The strength of these effects will depend, in part, on the choice of the exchange rate regime.

Our results show that Asia's choice of the exchange rate regime has a significant effect on Europe's exposure to US shocks in the case of a productivity shock in the US non-traded goods sector. In case of a demand shock or a productivity shock in the US traded goods sector, the impact of Asia's choice of exchange rate regime on Europe's exposure to US shocks is more modest.

When nominal exchange rates cannot be used as a buffer for shocks, Asian firms react to shocks originating in the United States by implementing large price adjustments (since prices now have to do all the work) and this, in turn, strongly affects Europe's relative competitive position. This adjustment is relatively more pronounced after a shock occurring in the US non-traded goods sector. Our model shows that the adjustment of Asian prices dominates the other effects induced by the pegging of the Asian currency. Overall, the fixed exchange rate in Asia increases the exposure of output and inflation in Europe to shocks originating in the United States albeit modestly. We can extend this result to China, the largest Asian economy. If China eventually decided to float her currency, Europe's exposure to US shocks would decrease modestly.

Our results also indicate that, for a reasonable calibration, the overall volatility of Europe's output and inflation depends mainly on domestic, and not foreign, shocks. Therefore, even these significant changes in Europe's exposure to US shocks, following China's floating, might not have large effects on the overall volatility of Europe's inflation and output.

Too many to fail — an analysis of time-inconsistency in bank closure policies

Summary of Working Paper no. 319 Viral Acharya and Tanju Yorulmazer

Resolution policies for bank failures that regulators try to follow in a consistent manner over time suffer from a 'too-many-to-fail' problem. In order to avoid losses resulting from the closure and liquidation of banks, a regulator finds it optimal to bail out banks when the number of failures is large. In contrast, if only a small set of banks fail, there may be a market solution that involves private sector participation in the form of acquisition of failed banks by the surviving banks. In particular, as the number of failed banks increases, the total investment capacity of surviving banks decreases and it becomes more likely that some banks would have to be liquidated to investors outside the banking sector resulting in a loss of continuation values. In turn, it becomes optimal for the regulator to bail out some of these failed banks instead of liquidating them during financial crises that affect a significant portion of the banking industry, that is, during crises that are systemic in nature.

This means that the regulator bails out banks during systemic banking crises, but during minor crises the regulator resorts to a private sector resolution where the failed bank is acquired by healthy banks. This too-many-to-fail guarantee induces banks to herd and take on similar investments in order to increase the likelihood of being bailed out when they fail. For example, they may lend to similar industries or bet on common risks such as interest and mortgage rates. This, in turn, leads to too many systemic banking crises, where a significant portion of the banking system is severely affected. Thus, the regulator suffers from not being able to follow a credible resolution policy that is consistent over time. The policy of bailing out banks during systemic crises creates herding incentives for banks, resulting in too many systemic banking crises. To prevent this, the regulator should follow a policy of not rescuing banks in crises — but this is not credible when systemic crises occur.

While the too-big-to-fail problem has been extensively studied in the literature, the too-many-to-fail guarantee has received less attention from policymakers and academics even though such guarantees have been provided regularly to banks during systemic crises. Recognising and modelling the too-many-to-fail guarantee focuses attention on choices of banks as a group rather than on individual choices, which are the focus of the too-big-to-fail literature. Furthermore, while the too-big-to-fail problem affects primarily the large banks, the too-many-to-fail problem is potentially different in that it may also affect smaller banks.

In this paper, we formalise these ideas in a framework wherein the optimal bank failure resolution policies are derived based on a well-specified objective for the regulator, which involves maximising the output generated by the banking industry. We show that the too-many-to-fail guarantee focuses attention on choices of banks as a whole whereas the too-big-to-fail literature focuses on individual choices. Furthermore, while the too-big-to-fail problem affects primarily the large banks, the too-many-to-fail problem may also affect smaller banks.

It is important to emphasise that there may be other sources of bank herding and we view the too-many-to-fail channel of bank herding proposed in this paper as being complementary to the other channels discussed in the literature. The theories that do not rely on a role for the regulator include models that emphasise how bank managers have an incentive to mimic each other to preserve their reputation in the labour market. The issue of which of these channels are more prominent for bank behaviour is an empirical question, which requires further research in this interesting area.

Speeches

Through the looking glass: reform of the international institutions[1]

What does globalisation mean?

Humpty Dumpty said to Alice, 'When I use a word, it means just what I choose it to mean — neither more nor less'. So let me explain first what I mean by 'globalisation'. In his excellent book *Why globalization works*, Martin Wolf remarks, 'Globalization is a hideous word of obscure meaning, coined in the 1960s, that came into ever-greater vogue in the 1990s'. I think of globalisation as a process of increasing international economic integration accompanied by political agreement on the rules of the game which govern that process. The rise of China and India as trading powers is an example of increasing integration. And the accession of China into the World Trade Organisation is an example of the application of the rules of the game.

Globalisation is the driving force of many of the most significant changes in our economies. But it is far from a new phenomenon — it is as old as the human race itself. The European settlement of Australia represented the globalising forces of migration and capital flows over several centuries. To me one of the most poignant symbols of globalisation is the Australian War Memorial at Hyde Park Corner in London. In the first half of the 20th century — described by Isaiah Berlin as 'the worst century there has ever been' — thousands of Australians went to fight on the other side of the globe and to give their lives to a cause that transcended national interests.

One of the consequences of globalisation is that the impact of change in one part of the world on the lives of people in other parts is growing. In areas as diverse as trade, energy, combating terrorism, climate change, and the economic consequences of massive global imbalances with capital flowing from poor to rich countries, there are now growing spillovers from decisions in one country to the lives of people in others. In contrast to the horrors of two World Wars and the Great Depression, the strains and stresses of today's world do not seem insurmountable. How can we best deal with these challenges?

When the movement of people in Manchuria from subsistence rural agriculture to industrial employment influences which industries flourish in Manchester and Melbourne, and when changes in attitudes to asset management in Beijing affect currency values and hence living standards from Birmingham to Brisbane, it is in the interest of all nation states, recognising their growing interdependence, to make commitments to each other about what they will and won't do. Such commitments are embodied in international institutions — they are the rules of the game. Impressive offices and grand meetings are not the test of whether our international institutions are successful. The test is whether member countries are ready to make genuine commitments to each other. Without that the institutions lack any real purpose. So the subject of my talk today is why we need rules of the game to govern globalisation, and the institutions that are necessary to oversee those rules.

Is the post-war settlement still relevant today?

At the end of the Second World War, a new global order was put in place by the United States, Britain and their allies. One of those primarily responsible, US Secretary of State Dean Acheson, described his time as being 'present at the creation' of a new global order. A range of new international institutions was created — the United Nations, the two Bretton Woods institutions (the IMF and World Bank), the OEEC that implemented the Marshall Plan (and later became the OECD), NATO, and GATT (which has subsequently been succeeded by the World Trade Organisation).

Those institutions are now, for the most part, past their 60th birthdays. And there has been much heart-searching over the past few years as to their role and governance. Unless the spirit of the original founders is rekindled, there is a real danger that the present institutions will wither on the vine leaving us with a more unstable and fragile international environment. As Martin Wolf pointedly wrote, 'To defend a liberal world economy is not to defend the International Monetary Fund, the World Bank, the World Trade Organisation or any specific institution. These must be judged — and reformed or discarded — on their merits'. My argument is simple. Existing institutions were designed for a world radically different from that of today. The cost of closing them down and building new institutions is high. So we must work with our existing institutions and make them more relevant to today's problems. Unless we do so it will be harder to defend

(1) Inaugural International Distinguished Lecture to the Melbourne Centre for Financial Studies, Australia, on 21 December 2006. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2006/speech296.pdf.

an open and liberal international economic order which has brought benefits to hundreds of millions of people around the globe.

The generic challenge facing all the post-war institutions is to find a role relevant to present circumstances, and to decide on the operational capabilities and instruments which that role requires. Holding meetings and issuing communiqués is not enough. As a central banker, I naturally focus more on the IMF, and I shall do that today. But the lessons are general. It is worth noting the scale of the challenge. The specific commitments made at the end of the Second World War are no longer relevant. The shared experience of the Great Depression, protectionism and two World Wars has faded. And the majority of current nation states were not 'present at the creation'.

The world has certainly changed since 1945, and it is the nature of those changes which underpins the case for reform. The world today is different from that at the creation of the post-war settlement in two important respects.

First, despite the increasing integration of the world economy, which might appear to reduce the effect of national policies, the nation state has in fact flourished since 1945. The collapse of ideology and empire, and the triumph of the ideas of a liberal market economy, have been accompanied by an extraordinary expansion in the number of countries in the world. In 1946 there were fewer than 80 countries. Now there are 192 members of the UN. Much of that increase represents the division of empires, such as the former Soviet Union, into new states, as well as growing ethnic separation. Most of these new countries were not 'present at the creation' and see no reason why they should acquiesce in governance arrangements made in their absence. And the economic weight of countries has changed greatly since the post-war international institutions were set up. In 1950, Asian countries accounted for a sixth of world GDP measured at purchasing power parity. Now they account for more than a third.

Second, the world economy is very different today than when the IMF, the World Bank, and the other international economic institutions were set up. At the end of the Second World War, the international monetary system was built around fixed exchange rates and controls on capital flows. The rules of the game were simple. Countries were supposed to balance their current account. When 'imbalances' arose, they were under an obligation to correct them. In practice, however, the obligations on creditor and debtor countries did not prove to be symmetric. Over time the advantages of capital flows, particularly in the private sector, became apparent, and in a world without capital controls, it is possible to maintain independent monetary policies only by allowing exchange rates to float. So the Bretton Woods system eventually proved unsustainable, and today most advanced industrial countries have floating exchange rates and free movement of capital. Private capital flows now dwarf official flows. And 'imbalances' can apparently persist almost indefinitely. The US current account deficit, now almost 7% of GDP, has been over 3% ever since 1999. Australia has run a persistent current account deficit since 1973. Accordingly, the international institutions have shifted the focus of their attention from current to capital account flows and to the fragility of national balance sheets.

Those changes have meant that, over time, the post-war settlement has become less relevant. But the need for international institutions has increased. Our own standards of living are now, more than ever, affected by decisions elsewhere. And many people already feel they are losers from globalisation. The number of workers in the world trading system has more than doubled in a short period, with inevitable consequences for real wages of the unskilled in the industrialised world. Governments are having to work harder to explain what the principle of comparative advantage means to people in their daily lives.

In fact, most people are winners from globalisation. China is now the second largest buyer of Australian exports. And the Australian terms of trade have risen by 40% since 2000, providing a substantial boost to the growth rate of real incomes. Nothing could be more damaging to the prospects of developing and developed countries alike than the abandonment of further trade liberalisation. But protectionist sentiments are abroad again, even with high employment rates around the world. In Europe they are concealed as cries for 'national champions'; in Latin America as populism; in the United States as complaints about unfair competition. But the damage that protectionism can wreak is clear — the experience of the Great Depression should be enough to ring alarm bells.

If that is to be avoided and we are to maintain widespread support for an open international trading system, it is in all our interests to establish clear rules for what we will and won't do in areas where our decisions affect stability elsewhere. And if those commitments are to be upheld, we will need international institutions.

The role of international institutions was thrown into sharp relief last week by the visit to Beijing of the new US Secretary of the Treasury, Hank Paulson, and a high-level team for a 'strategic economic dialogue' with the Chinese Government. The issues discussed — the Chinese strategy for economic development and its implications for the pace of the shift of labour from rural agriculture to urban industry, saving rates in the United States, financial reform in China, and certainly the dollar-renminbi exchange rate — are all in the purview of several multilateral bodies, such as the new IMF multilateral consultation, the bi-annual IMFC meetings, the BIS, the G7, the

G20, and so on. Progress at bilateral meetings is to be welcomed. Indeed, the existing multilateral forums may simply be too cumbersome or inefficient for any useful dialogue to occur. But many of the most pressing economic concerns cannot easily be handled in a bilateral setting. For example, even the infamous international 'imbalances' can no longer be seen as a bilateral phenomenon: a large US trade deficit matched by a large Chinese trade surplus. Following the rise in oil prices over the past two years, the largest current account imbalances are to be found in the oil-producing countries. The combined trade surplus of OPEC in 2006 is likely to be around $400 billion, compared with a surplus in China of $150 billion. The pattern of trade imbalances and exchange rate movements is inherently a multilateral one, and real progress requires dialogue in a multilateral setting.

What are the principles of institutional design?

Changes to the number of nation states and the way they interact mean that reform of our multilateral institutions is needed. But piecemeal reforms are unlikely to work. In my view, there are five principles that should be followed.

First, create international institutions only when there is a need to do so. International institutions should focus on those areas of global governance where we need to tackle problems collectively — whether on trade, the environment, or large spillover effects of changes in macroeconomic policy.

Second, ensure that the commitments countries enter into are clear. The job of institutions is to support those commitments. In many cases, like an umpire, their job will be to uphold them. That will only be possible if the players — countries — are very clear about the agreed rules of the game. Without that, any further design is pointless.

Third, provide institutions with the necessary tools to umpire the commitments of nation states. But, just as umpires are accountable for their performance to the whole community of cricket-playing nations through the International Cricket Council, the staff and management of the international institutions should be accountable to the whole community of nation states for their performance in upholding the rules.

Fourth, recognise that we do not start with a blank sheet of paper. We must accept the constraints of history. Existing institutions have an institutional memory, talented staff and much of the infrastructure that will be needed in the future. But that is not to say reform will be easy — there are far too many vested interests for that to be the case.

Fifth, avoid unnecessary duplication. Because the cost of abolishing institutions is high, the number of international groupings and institutions has proliferated in recent years. Many of them tread on each others toes. As a result, the IMF, World Bank and OECD, have all been bruised. Duplication of roles is wasteful of time, money and focus. Each institution should have one very clear remit, and focus on it. Of course, countries which play a role in one institution but not in another will have an incentive to build up the role of the former at the expense of the latter. So it is up to the member countries to limit the battle for turf.

There are few examples where all these principles appear to have been followed. The World Trade Organisation has been an effective umpire of countries' commitments about trade restrictions and comes close. But the example of the WTO highlights the importance, above all else, of clear commitments from nation states themselves. The failure of countries to conclude a multilateral trade round since the WTO was formed more than a decade ago is worrying. The Doha round has continued past its expected completion date and only a brave commentator would forecast eventual success. The fault does not lie with the WTO. Instead, it reflects the fact that national governments have not been willing to make the necessary commitments.

What do those principles mean for the IMF?

With those principles in mind, I want to consider the challenge of reforming the IMF.

Do we need an IMF?

The apparent success of central banks has led some economists to argue that the widespread adoption of inflation targets and floating exchange rates is sufficient to ensure the smooth running of the international monetary system — a regime which Professor Andrew Rose calls the 'reverse Bretton Woods system'. There is no need for an international institution such as the IMF to watch over the system.

It is certainly true that the most important thing any nation state can do to minimise the spillover effects it has on others is to maintain domestic economic stability. And that is exactly what Australia, Britain, and other countries have done during the recent period of economic success, known as the 'Great Stability'.

But domestic stability is not sufficient to eliminate spillover effects. The impact of national macroeconomic policy decisions is transmitted to other countries through important prices in the world economy: real exchange rates; real interest rates; and prices of important commodities like oil. Changes in spending by US households affect export demand in the rest of the world, both directly and indirectly through movements in the dollar. Changes in saving by governments in Asia affect spending in the rest of the world through movements in real interest rates. Changes in the supply of oil from the

Middle East affect incomes and spending elsewhere through movements in oil prices.

Moreover, not everyone has a floating exchange rate and an inflation target, and countries that try to prevent adjustment of their real exchange rates have exacerbated the problem of spillover effects.

Businesses in every country are conscious of how quickly their plans can be disrupted by unpredictable swings in exchange rates, asset prices and commodity prices. When those spillovers are sufficiently large and widespread, countries will want to engage with each other in a multilateral setting to discuss how they should be resolved.

What commitments are needed?

Before the collapse of the Bretton Woods system, the specific commitments made by countries to each other were very clear: fixed exchange rates and capital controls. In the wake of the collapse of Bretton Woods, the members of the IMF attempted to re-define their commitments. But the exercise of defining what practical commitments were needed focused primarily on exchange rates and had rather little effect in practice.

Two broad commitments are particularly important. First, countries should make public commitments about their targets for macroeconomic policies — fiscal, monetary and financial. That still allows countries considerable discretion in their choice of policy framework — for example, whether to adopt a fixed or floating exchange rate. Second, policy frameworks must be consistent across countries. Policies which try to prevent changes in real exchange rates in response to changes in fundamentals, or lead to an unsustainable build-up of external debt, are properly the concern of the international community.

What tools are needed?

The main tool to monitor those commitments is surveillance. The surveillance activities of the IMF have rightly been criticised because they pay insufficient attention to spillover effects and instead examine in unnecessary detail microeconomic issues. For example, the sharp rise in oil prices over the past two years has posed a risk to economic stability in many countries. But there is no reference in the IMF's Article IV report on China to the role that Chinese demand may have played in pushing up world oil prices. And the report on the United States this year singled out the electricity sector and competition among auto manufacturers and airlines as areas warranting special examination by IMF staff. It would be better if those microeconomic issues were examined within the OECD, and, in turn, issues of macroeconomic spillovers and global 'imbalances' were left to the IMF. But even when IMF surveillance has been well focused, as in the analysis of Thailand's exchange rate policies in 1996, it has not always carried sufficient weight to influence countries' policies.

These shortcomings must be remedied in two ways. First, the focus of IMF surveillance should be on spillover effects and the consistency of macroeconomic policy frameworks. By the Spring Meetings of the IMF in Washington in April next year, we shall know whether this is likely when we see the results of the current review of the 1977 decision on exchange rate surveillance.

Second, IMF surveillance should be more independent of member countries. That will allow clear messages to be delivered about whether countries are living up to their commitments. A remit should be set annually. It would play two roles: it would give the IMF a clear mandate to guide its surveillance activities and it would give the shareholders a yardstick against which to hold the IMF staff accountable. Greater independence for staff should be accompanied by greater accountability.

What are the constraints of history?

The Bretton Woods conference at which the IMF was established was attended by the governments of just 44 countries. Yet even that was fraught. It would be vastly more difficult to agree a complete new treaty with 184 countries. The IMF has much of the infrastructure and expertise that will be needed to do the job I have described — and an annual budget of $1 billion to do it. That is why it makes sense to attempt to reform the IMF that we have inherited rather than to build a new institution.

But the inherited governance structure of the IMF and other institutions complicates matters. The founders of the post-war settlement encumbered several of the international institutions with unwieldy full-time resident boards. And the distribution of voting rights no longer reflects the economic and political weight of member countries. The task of agreeing on a new system will be enormously difficult. But if we fail, the influence of the institutions will diminish further, possibly irreparably.

Reform of IMF surveillance and voting rights of member countries complement each other. Voting rights are an area where hard work and many hours of persuasion will be needed if countries are to be convinced to see the bigger picture and relinquish some degree of direct control over the IMF in return for the creation of a more effective institution. Hard work, perseverance and dogged determination have been characteristics of this year's Australian presidency of the G20 under Peter Costello, Ian MacFarlane and Glenn Stevens. Their efforts have been crucial to the progress that has been made towards quota reform over the past year. It is important that the Australian legacy be carried forward if the process of quota reform is to be completed.

Are there overlaps with other institutions?

Unnecessary duplication is a waste of both time and money. I have already spoken about the respective comparative advantages of the IMF and OECD. There has also been some discussion about the roles of the IMF and the G7 in respect of exchange rate issues. Over the past three years — especially since the Boca Raton G7 summit of February 2004 — the inability of the G7 to deal with the major spillover effects in the world economy has become more and more evident. Adding new members, even if they were willing to join, is not the answer. More productive would be to use the IMF as a flexible forum to bring the relevant group of countries together to handle issues as and when they arise.

Conclusions

The meetings of the IMF in Washington and Singapore this year marked the beginning of an attempt to define more clearly the role of the Fund in the world economy. Whether that will prove successful is too early to tell. But the challenge is clear. Globalisation increases our dependence on each other. It is no longer sufficient to rely on the commitments made 60 years ago — the world has changed too much since then.

It is up to the member countries to make a multilateral trading system work. As Joseph Conrad wrote a century ago in his great novel *Nostromo*, 'Action is consolatory. It is the enemy of thought and the friend of flattering illusions'. The frenetic activity of international meetings and the flattering illusions of a stream of communiqués do not add up to a coherent set of commitments.

Failure to reform the international institutions will condemn them to irrelevance and obscurity. We are at that point. If this generation fails, then the work of those who were 'present at the creation' will have been undone. It is our duty to re-create the institutional framework that we inherited.

It will not be easy. But in case like Alice you are tempted to think that, 'There's no use trying; one can't believe impossible things', remember the Queen's reply: 'Why, sometimes I've believed as many as six impossible things before breakfast'.

The Governor's speech[1] to the Birmingham Chamber of Commerce Annual Banquet

Lord Mayor, Lady Mayoress, President, Distinguished Guests, Ladies and Gentlemen.

Two weeks ago your Chamber of Commerce called on the Bank of England to take manufacturing more seriously when it sets interest rates. In arguing against an interest rate rise, the Birmingham Chamber said, 'we would urge the Bank of England to once again consider the effects this will have on the beleaguered manufacturing sector'. It will not have escaped your attention that Bank Rate did rise in January and has now increased by 75 basis points since the beginning of August. So tonight I want to explain why the Monetary Policy Committee took that action, and why the Bank believes that the control of inflation is essential for the success of Birmingham — and all British — manufacturing.

Last week we learnt that inflation, as measured by the consumer prices index, was 3% in December, the highest level since the Monetary Policy Committee was set up almost ten years ago. If it rises by one further decimal point to 3.1%, I shall have to write an open letter to the Chancellor explaining why inflation has risen to more than 1 percentage point above the target of 2%, and what measures the Committee are taking to bring inflation back to target.

RPI inflation has risen to 4.4%, the highest rate since December 1991. And RPIX inflation — the target which governed our decisions until December 2003 — has risen to 3.8%, which would have triggered a letter under the old target.

In 1997, I suggested that 'Given past experience of inflation volatility, it is likely, even allowing for the change in policy regime, that the MPC will have many opportunities to restore the lost art of letter writing to British life'. It is really very surprising that no opportunity has yet arisen. As I stressed back then, it is important to understand — and many commentators seem to misunderstand — that the inflation target is not a range of 1%–3%, but a target of 2% at which the Monetary Policy Committee continually aims.

So an inflation rate of 3.1% is simply a trigger for a public explanation of why inflation has risen above target and what the Committee proposes to do about it. Letter writing is a key part of the accountability provisions of the monetary policy framework created in 1997, and I would welcome the chance to demonstrate how the process is meant to work. The opportunity to write to the Chancellor did not arise last week. But since we are so close to the level that would trigger a letter, let me instead write a letter to you.

Over the past year CPI inflation has risen by a percentage point, from around 2% to 3%. That was not the Committee's expectation a year ago when it believed the most likely outcome was for inflation to stay around 2%. And at that point many commentators were predicting cuts in interest rates in 2006. So what happened? Part of the story has been a further sharp rise in energy prices during 2006. But it is only a part. It is impossible to be sure what explains the rest of this unexpected drift up in inflation. But three factors seem to be relevant.

First, the historically low level of interest rates and rapid growth of money and credit have contributed to rising asset prices and buoyant nominal spending, not just in the United Kingdom but around the industrialised world. Spending and capacity pressures in the UK economy recovered from the slowdown in 2005 faster than many had expected.

Second, and a direct consequence of the first, is that inflation expectations have risen. Firms have been able to raise prices a little faster than before with the expectation that now those increases would stick. As the Birmingham Chamber's own recent quarterly survey showed — 'over half of the City's manufacturers were intending to increase prices in the next three months'. One of the reasons for the success of inflation targeting is the anchor which it gives to inflation expectations. But, when inflation moves away from target, we must prevent the anchor from dragging. Expectations need to be firmly fixed on the 2% target.

Third, increasing cost pressures have made it more difficult to sustain profit margins without raising prices. Energy and import prices are one source of higher costs. Another is the cost of employing labour which has been rising faster than the

(1) Given on 23 January 2007. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech300.pdf.

growth of real take-home pay. Higher pension costs for companies, on the one hand, and higher taxes, petrol and utility prices for employees, on the other, have opened up a gap between increases in the pay bill and real take-home pay. If investment and employment growth are to be maintained, the burden of these higher costs must either be passed back in the form of reduced input costs or forward as higher prices. So far, pay pressures have been subdued, but not sufficiently so to mitigate the rise in costs to employers. As a result, companies have scaled back their demand for labour and looked to raise prices.

The risks to money spending, inflation expectations and cost pressures were not overlooked by the MPC and were explicitly identified as upside risks to inflation both in speeches and in our monthly minutes back in 2005. In the event, the upside risks to inflation did materialise to some extent. And a year ago, the MPC thought the risks to GDP growth were on the downside. Yet, the total output of the United Kingdom, leaving to one side the energy sector, has been rising at an annual rate of over 3%. And over the past month some of the key spending and activity indicators have been strong.

The balance of risks to output growth and inflation has shifted towards the upside. As those risks began to materialise, the MPC acted.

The Committee started to raise interest rates to deal with the changing balance of risks last August, and has now raised rates by 75 basis points in total to keep inflation on track to hit the target. But, by responding early to changes in the inflation outlook, the MPC ultimately needs to raise interest rates by less than would be the case if we delayed.

Looking forward, some of the factors responsible for the pickup in inflation through 2006 are likely to unwind during 2007. Oil prices have fallen by around a third since August, and will feed through to petrol and utility prices. The rise in the exchange rate will dampen the impact of higher import prices.

It is also important not to exaggerate the effect of stronger demand on inflation. As we pointed out in our November *Inflation Report*, the ability to recruit migrant labour continues to offer a safety-valve for demand pressures in the economy, and is, no doubt, in some part responsible for the continued muted level of wage pressures. That is a particular help in present circumstances, and has reduced the extent to which interest rates have needed to rise.

But how quickly and by how much inflation will fall over the next year or so is difficult to judge. Falls in some important prices, such as petrol and utility charges, mean that people will have more disposable incomes to spend on other goods and services. That may encourage producers of those goods and services to raise prices. Equally, companies will be under less pressure to reduce other costs, affecting their response to upward pressures on earnings growth. The Committee will be monitoring carefully the outcomes month by month. All I can say is that the Committee's central view remains that inflation is likely to fall back in the second half of the year, possibly quite sharply.

As ever, there are risks around that central view — in both directions. Some of the biggest risks surround energy prices, supply factors such as migration, the level of asset prices, and the extent to which inflation expectations will prove to be a fixed or dragging anchor. Pay growth is also important. As I said earlier, if investment and employment growth are to be maintained, the burden of higher costs on employers must either be passed back in the form of lower input costs or forward as higher prices. All of us — whether on the shop floor, in the board room, or in the public sector — are coming to terms with the fact that those higher costs imply a temporary, but only a temporary, slowing in the growth of our real take-home pay. That adjustment — difficult but inevitable — will be helped by the fall in energy prices since last autumn. But the belief that we could avoid the adjustment by pushing up our pay would lead to a self-defeating process of higher wages offset by higher prices. It is the task of the MPC to ensure that the process of adjustment does not lead to a persistent rise in inflation.

Bank Rate was raised in order that inflation will come back to its 2% target, and future action will depend upon how those risks to the inflation outlook materialise.

The month-by-month path of interest rates required to bring inflation back to target is a matter of judgement. There is certainly room for reasonable people to disagree about the level or timing of changes in interest rates. There is no absolute truth here, and it is vital that the MPC keeps an open mind at all times.

That in essence is my letter to you and all the members of the Birmingham Chamber of Commerce.

Achieving the inflation target is, I believe, in the long-run interest of manufacturing no less than the rest of the economy. I recognise that the burden of changes in interest rates often falls disproportionately on manufacturers and other exporters as increases in interest rates push up the sterling exchange rate. And that comes on top of a secular decline — 50 years ago almost 40% of GDP was produced by the manufacturing sector. Today that share is around 14%. But the continued relative decline of manufacturing — and indeed the strength of sterling — over the past decade or so reflects, not the stance of monetary policy, but the remarkable wind of change that has blown across the world economy with the advent of China, India and much of the former Soviet Union into the world trading system. To their great

credit, business people and politicians have not resisted changes to the structure of the British economy, unlike many of their counterparts abroad. As a result, total output and employment here have grown rapidly, and our living standards are higher than could have been sustained with policies aimed to defend the old industrial structure.

Those changes, however, have led to the closure of many manufacturing companies. There are over a million fewer people employed in manufacturing now than a decade ago, and 200,000 fewer in the West Midlands. It is just over 100 years since car production started at Longbridge, just over 30 years since it was nationalised, and no vehicle has been built there for over a year. But there are also many success stories. Since I became Governor, I have made regular monthly visits to the regions and countries of the United Kingdom, and visited around 100 companies, large and small, new and old. I have been impressed by how they have focused on products in which they can add value and exploit their comparative advantage — whether a company in Northern Ireland exporting wall heaters to the newly rich of Shanghai and Beijing, a manufacturer in the North West exploiting a patent for paint which is resistant to very high temperatures, or a company in the Potteries passionate about the plates they make for the hotel and restaurant trade. And if you want a digger, why look further than a JCB? Proof that vehicle assembly in the West Midlands can be successful.

All of them — as all of you — are working in a highly competitive environment. It is indeed much harder to run a business than to run a central bank. But seeing those companies at first hand has made me even more convinced that our duty is to ensure that you do not experience the macroeconomic instabilities of the past and that we keep inflation on track to meet our 2% target. Stability is in your interest just as much as mine.

Speeches on monetary policy rarely whet the appetite for a good meal, and I apologise for that before the splendid dinner your Chamber is about to serve. But tonight has been an opportunity to share our analysis of the economic situation with you. I hope you will understand the reasons behind our decisions to raise interest rates over recent months, even if it goes against the grain to support them.

Long before I became Governor I said that my ambition was for monetary policy to be boring. You may feel that the latest decision was far from boring. But while it is true that the precise timing was unexpected by analysts, the direction in which interest rates were heading was predictable in terms of the underlying economic data, and indeed was quite clearly predicted — financial markets were anticipating a 25 basis point rise at the February meeting. Looking behind the stunned surprise in the headlines, much of the reaction to our latest decision was that it was only too clear why rates needed to be raised. As one paper wrote last week, 'while the timing of last week's rate rise caught many commentators on the hop, the reasoning behind the move is not at all a surprise'.

So I have certainly not abandoned my ambition to be boring. The basis for our prosperity is business. And the excitement in the economy will, I hope, continue to come from your businesses, your new products and ventures. After all, the MPC is there to make inflation, and hence the economy as a whole, more stable. It's up to you to steal the limelight and the headlines from us.

Perspectives on current monetary policy

In this speech,[1] Rachel Lomax, Deputy Governor for monetary policy, argues that the unusual stability experienced by the United Kingdom and many other countries over the past decade reflects a virtuous circle, in which central banks have taken advantage of relatively favourable global conditions to implement better policymaking frameworks and establish strong reputations for competence. But this increase in stability was not foreseen when the MPC was set up. Its formal remit makes allowance for situations in which inflation might be thrown sharply off course, and where attempts to keep it close to the target might cause undesirable volatility in output. She believes the current headline rate of inflation is being pushed around by movements in energy prices and while there is a risk that this could generate inflationary wage demands, in today's labour market there is quite a difference between asking for higher pay and getting it.

The decade to 2004 was one of the most remarkable in the United Kingdom's economic history. For the first time in a generation, inflation was low and stable. Output grew for 40 straight quarters, and the unemployment rate fell steadily to levels not seen since the mid-1970s. By these high standards, the economy's performance over the past couple of years looks slightly more mixed. After a mild slowdown in the first part of 2005, output has been growing steadily at around its long-term average rate for the past year. The inflation rate has varied around the target. But unemployment has been rising for most of the past 18 months.

As always, there is more than one view about what may be going on. I want to start by setting current monetary policy preoccupations in a broader context, and highlighting some difficult issues. Was the United Kingdom alone in experiencing such unusual economic stability since the mid-1990s? What might have caused it? Was it expected? Can we count on it continuing? And how should monetary policy makers deal with the exaggerated expectations that the stability of the past decade may have encouraged? I don't pretend to offer definitive answers to any of these questions. But they are very relevant to the ways that different members of the MPC think about the current situation, and approach the challenges now facing monetary policy.

The international context

I'll start by looking at the wider world.

The United Kingdom was not alone in enjoying a decade of unusual stability. Across the industrialised world, output growth and inflation were less volatile than in the 1970s and 1980s, though growth was disappointingly weak in Japan and Germany. The slowdowns that followed the East Asian crisis and the stock market crash were relatively mild and short-lived. Economists have named this period the Great Stability (or the Great Moderation, in the United States) and contrasted it with the Great Inflation of the 1970s. And there has been a lively but inconclusive debate about how much of this better performance is due to good luck and how much to good policy.

Over the past couple of years there has been a growing view among central bankers and some academics that a substantial part of the 'good luck' story may have reflected the benign effects of globalisation. This realisation has dawned as it has become clear that globalisation is having pervasive effects on our economies, as well as contributing to some trends which are not so immediately favourable.

Globalisation, in the present context, is shorthand for the increasing integration of international markets for goods and services, capital and labour. As we all know from first-hand experience, the world economy is being transformed by the lowering of all sorts of barriers to the free movement of people, money, knowledge, goods and services. These trends are, of course, as old as human history. But there have been periods, like the second half of the 19th century, when globalisation has proceeded rapidly and periods, like the first

(1) Given to the Cardiff Business Club at St. David's Hotel, Cardiff on 27 November 2006. I am very grateful to Gareth Ramsay for his help in preparing this speech, and to a number of colleagues at the Bank of England for useful comments. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2006/speech292.pdf.

half of the 20th century, when it has gone into retreat. The past fifteen years or so have been a period of major advance as a result of far-reaching political and regulatory changes as well as revolutions in technology and communications.

The pace of change has been striking in several key areas.

First, international capital flows have grown explosively, as financial markets have become more integrated. As a result, the value of the global stock of assets in cross-border ownership tripled over the ten years to 2004. As well as increasing the scope for mobilising savings and allocating capital across different markets, the development of deep and liquid international financial markets has opened up new possibilities for diversifying risks and smoothing the adjustment to unforeseen events. This should promote both economic stability as well as growth.

Second, the sheer scale and pace of economic development in China is without precedent. What is not new is its strong export orientation — this was the route taken by Japan and the East Asian Tiger economies. China is now a key part of both global and regional supply chains for the production of low-cost manufactured goods. China now produces 80% of the world's photocopiers, 50% of the world's textiles and 50% of the world's computers. These developments will tap the labour of hundreds of millions of people who were previously effectively outside the global market place. They are also triggering urbanisation — and infrastructure investment — on a scale, and at a rate, which makes our own Industrial Revolution look sedate, even puny.

The Chinese Government expects 300 million people to migrate from the countryside to urban areas over the next 20 years. China had no motorways in 1988, now it has 41,000 kilometres, second only to the United States. It is adding the equivalent of the United Kingdom's total power generating capacity every year. Beijing alone plans to build fifteen new metro lines by 2020, to create a network larger than the London Underground. No surprise, then, that China consumed 50% of the world's cement last year.

Third, and more tentatively, there seems to have been an increase in the international mobility of labour. This is the area where the continuing, largely political, barriers to free movement are most apparent, and where, partly in consequence, it is hardest to assemble reliable information. Nevertheless, many developed countries seem to have been experiencing increases in their long and short-term immigrant workforces, both skilled and unskilled — notably the United States, where the foreign-born workforce is now around 15% of the total, and a number of Southern European countries. Italy and Spain both had increases in their foreign-born workforces of over a million in the five years to 2004. There have been smaller, but still sizable, increases, in Germany, Sweden, Ireland, the Netherlands, and the United Kingdom.(1)

It is too soon to assess the full impact of these developments on the performance of industrial countries. A few obviously important effects have been identified but they may not turn out to be the most significant in the long term.

Most comment has focused on the direct effects of the emergence of China on relative prices, especially the price of manufactures relative to other goods and services. The emergence of an economic superpower with abundant supplies of labour and a relatively poor natural resource endowment has probably had several effects. First, it has pushed down on the price of manufactured goods over a long period of time. Across the world's industrial countries the real price of goods (adjusted for general inflation), fell by over 10% between 1995 and 2005. Second, in the past couple of years it has helped to fuel a sharp surge in world prices for energy and other commodities. Between the beginning of 2004 and their peak in August of this year, world oil prices rose from $30 to $78 a barrel. There have been comparable increases in the prices of metals and other raw materials over the same period.

Economists have also speculated that globalisation may be changing wage and price-setting behaviour in developed countries, by adding to the competitive pressures facing domestic producers and wage earners. This is not just a reflection of increased competition from cheap manufactured imports, and the greater availability of migrant labour to ease domestic labour shortages. A Welsh audience will need no reminding of the many ways in which both inward and outward foreign direct investment can affect domestic employment opportunities. Hard as it is to quantify, the net effect of these trends may have been to reduce the sensitivity of domestic inflation to changes in the margin of spare capacity in the economy.

But while these effects go some way towards explaining why the global inflationary climate may have been relatively benign over much of the past decade, I think they fall short of providing a complete explanation for the strength and resilience of global output growth. For this we might look to the more elusive influence of financial integration, and the added impetus to global growth provided by the increasing weight of fast-emerging market economies, particularly in Asia.

It is just worth pausing on the remarkable ease with which the world economy has apparently absorbed the impact of sharply higher oil prices. World output expanded at its fastest rate for 30 years in 2004, and this year growth looks like being as

(1) Data from OECD's *International Migration Outlook 2006*.

strong again. One obvious explanation is that both high oil prices and the strength in the world economy have reflected the rapid pace of development in China, where growth has been around 10% a year since 2004, and which last year was responsible for nearly half of the growth in total world oil demand. So the two have helped to offset each other.

But the recent behaviour of oil prices has also reflected supply-side problems. The rapid growth in demand seems to have taken oil producers by surprise. The world is currently operating on a very thin margin of spare oil production capacity as a result of low investment in the 1990s. The result is that oil prices have also been volatile, as well as high, moving sharply in response to geopolitical and weather-related news, as well as changing expectations about world demand and supply. In time, both supply and demand will respond to higher prices, but the lead times for new production capacity are very long — around ten years to develop a new field.

High and volatile oil prices pose a grisly challenge for monetary policy makers. But so far there has been no surge in inflation across the world as there was following the oil price increases in the 1970s. True, headline inflation rose initially in many countries, especially the United States, where it ticked up to nearly 5%, before falling sharply to less than 1.5% when oil prices fell this autumn. But central banks have been on the alert for any signs that higher oil prices would feed into higher wages, and so trigger an inflationary spiral. And so far wage growth has remained moderate in all developed countries, including the United Kingdom.

Monetary policy

Inflation has remained firmly under control despite a doubling in the price of oil. This, to my mind, is striking evidence of a sea change in policy since the 1970s. But how far was the Great Stability due to good policy, as opposed to globalisation or plain good luck? This broader question is probably unanswerable, but a couple of points are worth making.

First, there is no doubt that, in the medium term, the actual inflation rate is determined by the Bank of England. Our decisions about interest rates — the price of money — determine the amount of total money spending in the economy. The rate of inflation reflects the difference between this spending and what the economy is capable of producing — total supply. The faster money spending grows relative to supply, the higher inflation will be. In that sense low inflation reflects policy, not luck.

But external conditions may make it more or less easy to keep inflation low and stable. If the Bank aims for a low but positive rate of inflation, and imported goods prices are falling, the prices of other goods and services will have to rise faster to compensate. So for example, the prices of imported goods and services *fell* by 13% between 1995 and 2004, while the prices of other consumer goods and services *rose*, on average, by around 20%. To produce this result, and keep overall inflation close to target (as it was), the Bank was probably able to keep interest rates lower than they might otherwise have been.

That's why people sometimes say that the falling world prices resulting from globalisation have acted as 'favourable tailwinds' for central banks over the past decade. And why, over the past couple of years, there have been worries that high and volatile energy prices would provide 'strong headwinds'.

Second, there have been important innovations in the practice of monetary policy over the past decade. These have not been confined to the United Kingdom — there is an international traffic in good monetary policy ideas, as in almost everything else. So while the United Kingdom was a pioneer in some respects, our current approach to policy is more fairly described as close to international best practice. There's been a widespread move to give central banks more independence, with clear objectives and a strong commitment to transparency and accountability. In the United Kingdom, we adopted a target for inflation as long ago as 1992 and the whole framework for taking decisions about interest rates was overhauled after the 1997 election.

I am sometimes asked how different British economic history would have been if we had adopted the present approach to monetary policy at various landmark dates — such as 1976 or 1979. This is a hard one.

Tolstoy famously said that all happy families are alike, but unhappy families are each unhappy in their own way. It is rather the same with monetary policy. There are very many ways of getting it wrong — the United Kingdom has some experience here — but the hallmark of all good monetary policy is what Hans Dietrich Tietmeyer (President of the Bundesbank in the 1990s) used to call 'the three Cs': credibility, consistency, and continuity.

My own view, for what it is worth, is that there has been a virtuous circle over the past ten to fifteen years when central banks have taken advantage of relatively benign global conditions to embed the three Cs, by successfully implementing better policymaking frameworks and establishing strong reputations for competence on the back of excellent track records. The Bank of England would have faced a tougher challenge in doing this in the economic circumstances of the 1980s, and certainly the 1970s — even if the political consensus had existed to support such an experiment (which it didn't). Even the Bundesbank built up its

formidable reputation during the German post-war economic miracle.

That said, I do not think there is any doubt that the new approach to monetary policy did represent a major advance on what went before. In what way? Inflation targeting, the United Kingdom's current approach, broke with past attempts to run an independent monetary policy by offering commitment and clarity. For the first time, the Government and the Bank of England committed to clear objectives, clear communications and clear lines of accountability. We now have a decision-taking framework which allows monetary policy makers plenty of room for discretion, while forcing them to provide a full explanation of their thinking.

By hook or by crook, the fact is that central banks do now enjoy considerable credibility. They treasure that legacy, much like any blue chip company, and for many of the same reasons. Credibility, and the trust that flows from it, is worth a great deal in policymaking, as in business. If people believe that the Bank will act to keep inflation low and stable they will factor that in to their decisions. (They may have been doing this recently, in judging how to respond to higher oil prices.) If so, that in turn makes it easier for the Bank to keep inflation on track, and reduces the fluctuations in output that controlling inflation can involve. So it is not implausible to assign a significant role to better policy in explaining the Great Stability.

But the extraordinary stability of the past decade may have given people an exaggerated idea of what to expect of monetary policy. While the Bank can deliver low inflation, we cannot reliably deliver rock steady growth in output and employment, still less falling unemployment. Whether or not that happens depends on events in the wider world — what economists like to call 'shocks' — and other economic policies, including taxes and regulations. All we can do is try to keep demand growing in line with supply.

And in fact, most economists a decade ago would have said that the Great Stability, as we have experienced it in the United Kingdom, represented a pretty unlikely set of outcomes. The then Governor, Eddie George, said he hoped that low inflation would contribute to a more stable economy but warned: 'We cannot hope to achieve that with any great precision'.(1)

The MPC's formal remit from the Chancellor, originally drafted nearly a decade ago and still in force, seems to be predicated on a more turbulent world. It makes specific allowance for situations in which inflation might be thrown sharply off course. It reads:

> 'The framework is based on the recognition that the actual inflation rate will on occasions depart from its target as a result of shocks and disturbances. Attempts to keep inflation at the inflation target in these circumstances may cause undesirable volatility in output. But if inflation moves away from the target by more than 1 percentage point in either direction I shall expect you to send an open letter to me setting out the reasons why inflation has moved away from target …and the period in which you expect inflation to return to target.'

In 1998 Charlie Bean, now (but not then) the Bank's Chief Economist, calculated that open letters might be triggered at least 40% of the time, on the basis of past experience.(2) This did not seem unreasonable at the time. But after 114 monthly decisions, inflation has always been within 1 percentage point of the target. And I take the fact that no Governor has yet sent an open letter as further evidence that there has indeed been an unexpected increase in stability.

Where are we now?

Are we now entering choppier waters? The world economy continues to grow at an impressive rate, with few signs of sustained inflationary pressure. Globalisation continues apace. But it is not difficult to think of things that could go wrong, ranging from an outbreak of protectionism, to another sharp surge in oil prices in response to geopolitical events, to a sharp correction in housing markets, which in a number of countries are very richly valued.

But mindful of the old Chinese proverb that 'He who lives by the crystal ball will die from eating broken glass' I will stick to interpreting what's happening in the economy right now. I'll focus on two issues: first, what's happening to inflation? And second, why has unemployment risen?

Over the past couple of years, the headline rate of inflation has been pushed about by sharp movements in energy prices. Back in the autumn of 2004, CPI inflation was closer to 1% than the 2% target. A year later it had risen to 2.5%. It then fell back below target until the spring of this year, when it moved back up to around its present level of just below 2.5%.

The first spike in inflation above the target — in the autumn of 2005 — corresponds with the very sharp rise in petrol prices around the time of hurricane Katrina. The second upward movement corresponds with the big jump in domestic gas and electricity prices this spring. This autumn petrol prices have fallen back sharply from their August peak. But CPI inflation has scarcely changed. Why? The simplest explanation is that the recorded inflation rate is still being boosted by high utility prices, and the effect of lower petrol prices has been partly

(1) Mais Lecture, June 1997.
(2) Bean, C (1998), 'The new UK monetary arrangements: a view from the literature', *Economic Journal*.

offset by high seasonal food prices and the introduction of university tuition fees. Any broader-based pickup in inflation has been relatively small.

Of course, life is not quite that simple. The prices of individual goods and services go up and down all the time. And large individual price changes — whether or not you take them out of your preferred measure of inflation, as some central banks do — always add to the difficulties of interpretation. The MPC needs to focus on persistent price movements. It has to look through short-run volatility and judge how fast the average price level is likely to rise over the next few years. This is the time horizon which is relevant for policy, since changes in interest rates take a year or two to have their effect. The current rate of inflation says rather little about where inflation is likely to go. We need to judge, as best we can, the changing balance of supply and demand in the economy — inflationary pressure.

But why has unemployment been rising? One possibility is that the labour market is still feeling the effects of the period of below-trend growth in late 2004 and 2005. We know that employers tended to hold on to people then rather than letting them go, probably because they expected — rightly as it turned out — that the slowdown would be shallow and short-lived. As demand picked up, they were able to work their existing staff harder again, rather than hiring new people straight away.

But meanwhile the potential workforce — the number of people in work or who say they would like to work — has been growing at its fastest rate in 20 years. This reflects a number of developments. First, the influx of workers from abroad, including from the European Union accession countries. The precise figures are very uncertain, not least because people come and go a lot, but recent research(1) estimates that 2005 probably saw the largest ever entry of foreign workers to the United Kingdom, totalling around 400,000 — equivalent to around 1.5% of total employment (although outflows have probably risen, too). In addition, older workers are increasingly likely to stay in work — people above pensionable age accounted for a quarter of the growth in the workforce over the past year; and Government policies are encouraging people on benefit back into work.

The result has been that the labour force participation rate, the number of people in work and the number who are unemployed have all been rising at the same time — a fairly unusual combination. A faster growing labour force potentially raises the amount the economy can produce. Rather like raising the economy's speed limit, it implies that it can grow faster without hitting supply constraints and generating inflationary pressure.

That may be the situation right now.

In any event, putting all this together with the impact of energy-related price movements, I do not read the fact that inflation is currently above target as convincing evidence that the economy is overheating. While demand has not been growing unusually slowly over the past year, it is now two and a half years since it grew at a rate significantly above its long-term average. And that average could be an underestimate of how fast we could safely grow.

Even so, there is a risk that a temporary rise in the inflation rate will spark off inflationary pay increases. And if that were to happen, the MPC would need to raise interest rates to restrain demand and bring inflation back to target. I thought this risk looked quite significant in August when — as the Governor said at the time — the Committee saw a 50/50 risk that consumer price inflation would rise above 3% this winter.

At the same time, the latest figures were confirming that the economy had recovered its momentum. So it seemed prudent to take back the modest cut in interest rates which the Committee had narrowly voted for the previous August. I cannot speak for other MPC members. But for me, raising rates this summer was akin to buying insurance against the risk that a possible spike in inflation — which we could do little to avert — would cause people to revise up their expectations about future inflation, and maybe dent the credibility which the Committee had built up over the previous decade.

Since August, the short and medium-term outlook for inflation have both improved somewhat, as world oil prices have fallen back very sharply, and sterling has risen. The odds of inflation rising above 3% have lengthened. There are still no real signs of pressure in the labour market. And while it never does to be complacent about pay, in today's labour market there is quite a difference between asking for higher pay and getting it — even in sectors not exposed to the full blast of global competition.

There are, of course, still some risks. But insurance is never costless. In the case of monetary policy, taking out insurance against risks that don't materialise can inject unnecessary volatility into the economy, with consequences for jobs as well as demand. That is why we have the remit we have. It gives the MPC scope to exercise its judgement. But those are precisely the sort of judgements about which reasonable people can — and probably — should disagree. So it was this month.

One judgement about which reasonable people could disagree is how robust the Committee's treasured credibility might be, if it ever came under real pressure. It is often said that it takes decades to build a high reputation but only a moment to lose

(1) Salt, J and Millar, J (2006), 'Foreign labour in the United Kingdom: current patterns and trends', *Labour Market Trends*, Office for National Statistics, October.

it. And there are plenty of business horror stories that seem to prove the point.

What moral should a member of the MPC draw? Is there a risk that the Great Stability has conferred a golden halo on the Committee which is only partly deserved? And that a more turbulent set of events could cause that halo to slip, and possibly trigger a sharp loss of credibility?

The MPC clearly cannot afford to be complacent. And we — and you — need to be realistic about what monetary policy can — and cannot — achieve. That said, I am confident that our present policy framework does have the capacity to withstand more turbulent times, should they materialise.

After all it was designed for them.

The MPC comes of age

As the MPC's tenth anniversary approaches, Rachel Lomax,[1] Deputy Governor for monetary policy, considers what was special about the 1997 policy framework, and how age and success have changed it. In her view, the key characteristic of the current approach to monetary policy is 'constrained discretion' — the combination of a strong commitment to low inflation with considerable flexibility to respond to shocks. While the so-called Great Stability of the past decade has bestowed on the MPC 'the great gift of credibility', it has had both helpful and unhelpful legacies. On one hand, the credibility of the framework has helped to contain inflation, in the face of large shocks. On the other, the public may have acquired unrealistic expectations about what monetary policy can achieve. She concludes that the policy framework can only offer flexibility as long as it remains credible. But that credibility needs to reflect reality.

Introduction

It's a great pleasure to be in Leicester tonight, particularly given my long association with De Montfort University, as a Governor.

Tonight I want to focus my remarks on the Monetary Policy Committee, which is ten years old this year. This is a blink of an eye in the life of the Old Lady of Threadneedle Street as she approaches 313. But UK monetary policy frameworks have lived dangerously and died young. For them, ten years is good going. To mark the occasion the Treasury Committee has launched a special inquiry. An impressive weight of written evidence has already been published, including a detailed review by the Bank of England.

Everyone agrees that the United Kingdom has experienced an unprecedented degree of economic stability over the past decade. The average rate of inflation has come down from nearly 10% in the 1970s and 1980s, to 2.5% since 1993, and the volatility of inflation has fallen very sharply. At the same time, output growth has been higher on average and less volatile.[2] The change has been stunning. To be fair though, it predates the formation of the MPC by several years; and other countries have experienced a similar, if not so pronounced, improvement in performance.

There is considerable agreement that better monetary policy is partly responsible for this better outcome, though there is an ongoing debate about exactly how much was also due to unusually benign global economic conditions, including the impact of globalisation.

Whatever the outcome of that debate, we clearly cannot bank on a trouble-free future. But we can and should look hard at the way our current monetary policy framework is operating, to give it the best chance of coping, if necessary, with a harsher climate. So tonight I want to consider what was so special about the MPC; and ten years on, ask how age and success has changed it; and what we can do to preserve its youthful vigour.

Historical background

The MPC has come to personify the monetary policy framework that was put in place when Gordon Brown made the Bank of England independent in 1997. But by monetary policy frameworks, I mean the broader set of rules and procedures for taking decisions about interest rates.

Prior to 1992, such frameworks often took the form of a commitment to maintain a fixed exchange rate, most recently as a member of the ERM. But these proved hard to sustain — sterling was repeatedly devalued, at great political cost to the Government of the day. Perhaps the most controversial frameworks took the form of commitments to meet targets for the growth in the money supply. These were meant to act as

(1) Speech given at De Montfort University, Leicester on 28 February 2007. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech303.pdf. I am grateful to Gareth Ramsay for his help in preparing this speech, and to James Proudman, Tony Yates and other colleagues at the Bank of England for helpful comments.

(2) Inflation has averaged 2.5% since 1997, with a standard deviation of 0.8%. In the two decades to 1992, it averaged 9.6%, with a standard deviation of some 5.6%. Over the past decade, output has grown steadily, averaging 2.8%, with a standard deviation of 0.7%, compared with an average of 2% and a standard deviation of 2.5% over the 1970s and 1980s.

rules, which would tie the hands of politicians, but they proved ineffective, not least because the underlying economic relationships broke down. There were also periods — notably the 1970s — when there was no discernible monetary policy framework at all; when monetary policy was in eclipse and governments relied on incomes polices to control inflation. These, too, were a dismal failure.

All these frameworks suffered from one of two basic problems. They either lacked credibility, or they lacked sufficient flexibility for policymakers to respond intelligently to events. So it is little surprise that they were associated with two decades of poor macroeconomic performance.

Sterling's exit from ERM in the autumn of 1992 led to an overhaul in the way monetary policy was conducted, with the adoption of an explicit target for inflation, and a number of moves to make the process of policymaking more transparent through the publication of minutes of what was popularly known as the Ken and Eddie show, and a new *Inflation Report*, produced by the Bank.

What was special about the 1997 arrangements?

In the event, 1992 marked a break with the past. But while the policy innovations of the 1993–97 years were showing promise, the framework remained relatively informal. And decisions about interest rates stayed in the hands of the Chancellor.

The change in Government in 1997 led to a far-reaching effort to institutionalise and depoliticise monetary policy arrangements. A new Bank of England Act stipulated that the objective of monetary policy should be domestic price stability, and only 'subject to that' to support the Government's objectives for output and employment. The Act left responsibility for setting an annual remit for inflation in the hands of the Chancellor; but it gave the Bank 'operational independence' to set interest rates to meet this target. Interest rate decisions were to be taken by committee of nine, which was to include four appropriately qualified external members.

With these changes, the United Kingdom had a fully articulated, credible domestic monetary policy framework, underpinned by statute, which gave the Bank, through the Monetary Policy Committee, an independent role in meeting an explicit inflation target.

What was the defining characteristic of this approach to policy, and other broadly contemporary frameworks developed by countries like Canada, New Zealand and Sweden? The best short answer is encapsulated in a term originally coined in 1997 by two US academics, Ben Bernanke and Frederic Mishkin (now Chair and member of the FOMC respectively). It is 'constrained discretion'.(1)

Bernanke described this as 'an approach that allows monetary policymakers considerable leeway in responding to economic shocks, financial disturbances, and other unforeseen developments. Importantly, however, this discretion of policymakers is constrained by a strong commitment to keeping inflation low and stable'.(2)

In the United Kingdom, the Government is constrained by the institutional framework, which is set in statute. And the MPC is constrained by the need to meet the inflation target. But while the MPC are told what to do, they are not told how to do it. At the operational level, there is a lot of discretion.

The commitment to meet the inflation target is fundamental, as a matter of law and economics. As long as it is credible, such a commitment will help to anchor people's expectations about future inflation, and stabilise their response to unexpected shocks. But the scope to exercise discretion about how long temporary inflation disturbances will be tolerated is critically important too, for the performance and long-term credibility of the framework. Of course it must be used with integrity — saying one thing and doing another, for short-term advantage, is toxic.

This approach was reflected in the Open Letter procedure, which was an explicit part of the 1997 arrangements. This recognised that the MPC would not attempt to bring inflation back to the target immediately following a large shock, but required the Governor to write a letter to the Chancellor if, as a result, inflation deviated from the (then) 2.5% target by more than 1 percentage point.

As Ed Balls commented in a lecture in 2001:(3)

'Some have assumed it [the requirement to write an open letter] exists for the Chancellor to discipline the MPC if inflation goes outside the target range. In fact the opposite is true… In the face of a supply-shock, such as a big jump in the oil price, which pushed inflation way off target, the MPC could only get inflation back to 2.5 per cent quickly through a draconian interest rate response — at the expense of stability, growth and jobs. Any sensible monetary policy maker would want a more measured and stability-oriented strategy to get inflation back to target. And it is the Open Letter system

(1) 'Inflation targeting: a new framework for monetary policy?', Ben Bernanke and Frederic Mishkin, *Journal of Economic Perspectives*, 1997.
(2) 'Constrained discretion and monetary policy', remarks by Ben Bernanke before the Money Marketeers of NY University, New York, February 2003.
(3) 'Delivering economic stability', Oxford Business Alumni Annual Lecture by Ed Balls, June 2001.

which both allows that more sensible approach to be explained by the MPC and allows the Chancellor publicly to endorse it.'

Constrained discretion also provides much needed room for learning. Monetary policy remains more art than science, and its practice is riven with uncertainties and risks. As the present Governor put it in a lecture delivered in 1997:(1) 'Inflation targets are a practical response to the fact that knowledge increases over time'.

So a framework of constrained discretion combines much needed scope to implement policy flexibly, in the light of both circumstances and experience, with the credibility benefits of committing policymakers to secure a pre-determined outcome for inflation. That, in essence, was the key difference from the failed experiments of the past.

The development of the MPC

The MPC got off to a good start. It inherited an inflation rate that had been low for the past five years. And the financial markets welcomed it by reducing the risk premia on UK assets.

No one had very clear expectations about how it would behave or how it might think. While it inherited some technical features of the previous regime, the new Committee had quite a lot of scope to define its own operating procedures and intellectual framework. If not a blank sheet of paper, it was a book with many pages still to fill. As time has gone by, whole volumes have been filled. The Committee's procedures and thinking have matured. It has acquired patterns of behaviour and earned a name for itself.

There have been a number of stages in the Committee's development. Early on the MPC took steps to set out the intellectual framework within which it would be operating, to promote public understanding and enhance credibility. Over time, the Committee's thinking has evolved, as members have rotated on and off the group, and as the Bank has struggled to understand developments in the wider world. And, as a result of taking more than 100 policy decisions, the MPC has acquired a track record, which has allowed others to draw their own conclusions about its likely behaviour in different circumstances.

Practice in other central banks has developed too, as inflation targeting has spread, and all central banks have become more transparent in their communications. This has raised the bar for a central bank that wants to stay at the leading edge of monetary policy practice.

Finally, the MPC has acquired an enviably high reputation as a result of its overall performance and the unprecedented stability of the economy over the past decade.

In short, the world has moved on, and the MPC has acquired a past and an identity.

Ten years is too soon for a mid-life crisis, but middle-aged members of the audience will readily recognise the pressures that advancing years can bring. Sometimes we are tempted to bask in past success, whether or not it is fully earned. In our better moments, we reflect on all that we have learnt, through bad times as well as good. But there are days when we peer in the mirror and ask anxiously whether we have lost our freshness and drive. Have we become too set in our ideas and in our ways? Have others stolen a march on us? Have we become, to a degree, prisoners of our own past? Maybe even victims of our own perceived success?

The only way to deal with such fears is to confront them. That is a far larger task than I can do justice to tonight, and it needs to be part of a continuing effort to improve our performance. But let me try and give you an overview of some of the main issues in the remainder of my remarks.

Intellectual development

I want to start with the MPC's intellectual development.

As the world around us changes, it throws up new policy challenges which force us to examine old ideas and develop new ones. So the MPC has been on an intellectual voyage of discovery since it was established.

The formation of the MPC unleashed a ferment of intellectual debate and activity inside the Bank. It was a thrilling time for those who were closely involved. The Committee had to set out how it thought about the world, first of all for itself, and then for the outside world. You can still see evidence of all this activity on the Bank's website — in speeches describing how the MPC saw the world, and in books which set out the MPC's models of the economy.

But the world does not stand still. Over the past decade, the Committee, and the Bank staff who support it, have had to confront some enormous changes in the economic environment. The Committee's thinking has had to evolve to meet this challenge.

Without going into detail — that would require another speech — let me give you a flavour of some of the questions with which we have been grappling during my own time on the Committee alone.

First, we have had to understand the implications of some very big movements in asset prices, both domestically and globally.

(1) 'The inflation target five years on', lecture delivered by Mervyn King at the London School of Economics, October 1997.

House prices have risen steadily, tripling since 1997, to reach record levels relative to household incomes and rents. Share prices soared in the run-up to the millennium, then slumped, but have subsequently recovered. There has been a long-running debate among central bankers about how they should respond to asset price booms — and possible busts — with some arguing that there is a case for taking pre-emptive action, over and above what might be warranted to meet the inflation target over the normal two to three-year horizon. There have been members of the MPC on both sides of this argument.

Second, there has been an acceleration in the pace of globalisation. The entry into the global market economy of China, India and Eastern Europe is effectively doubling the world economy's supply of workers — from 1.5 billion to 3 billion. This is having pervasive effects on wages, prices and, potentially, economic relationships in developed countries in ways we need to understand in order to set interest rates.

Third, the past few years have seen the largest recorded entry of foreign workers to the United Kingdom. This has increased the supply capacity of the economy, as well as boosting demand, but the precise scale and likely duration of these effects are very hard to judge. How is migration changing the ground rules by which we set policy? If labour shortages were to cause more migration, rather than higher wages, we would be in a rather different world from the one we are used to.

Finally, there has been a major surge in energy prices in the past three years — first a doubling in global oil prices, and then an even larger rise in natural gas prices which was specific to the United Kingdom. Up until now at least, the United Kingdom and the global economy appear to have weathered the impact of these major cost shocks remarkably well. But precisely because the world has moved on so much since the 1970s, it has not been straightforward to predict or understand the impact of higher energy prices on the inflationary process. (I will return to this subject later in my remarks.)

The MPC tackles challenges like these all the time: you will see these questions discussed in the minutes of our policy meetings, in our speeches, and in the quarterly *Inflation Report*. We also commission research into these questions, which we publish in academic papers. This is not research for its own sake; it is carried out to help Committee members, present and future, do a better job. We need to keep refreshing our intellectual capital. Half a century ago, Governor Cobbold famously said that the Bank of England is a bank, not a study group. Nowadays, the best central banks have something of the study group about them.

Anniversaries are a good moment to take stock. So the TC inquiry and other events will prompt us to review what we have learnt, and to identify where there are gaps in our knowledge.

Procedures and communications

The 1997 institutional reforms did more than take political considerations out of interest rate decisions. They were intended to convince people that the inflation-target regime was here to stay. The idea was to align expectations of future inflation more closely to the target, by putting monetary policy in the hands of technocrats whose behaviour would epitomise professionalism. The pre-announced monthly cycle of meetings, regular quarterly *Inflation Report* forecasts, and set briefing routines, were very much part of the package. The goal of these new arrangements was to make the system understandable and predictable to outsiders.

After a sharp burst of activity in the late 1990s, the processes and procedures surrounding monetary policy have now settled down. We still use much the same internal processes and means of communicating with the outside world as we did a decade ago.

But the outside world has not stood still, in at least two respects.

First, over time the MPC has established a track record of actions and communications which people have, as intended, learnt to parse with great precision. There is a cottage industry in interpreting its every utterance, in the light of its past behaviour, in order to predict its next actions. Any deviation from past behaviour is assumed to be deliberate and considered.

A topical example is the market reaction to the latest interest rate rise. The formal position has always been that the MPC may change rates at any one of its policy meetings. And in the early days of the Committee that's pretty close to what happened. But since 2001, as a matter of fact, rates have been much more likely to change in the months when we publish a new quarterly *Inflation Report*. That was why the January rate rise caused such surprise even though commentators were fully expecting a rate rise to accompany the February *Inflation Report*. Indeed, such was the surprise that the market immediately revised up its expectations for future interest rates. And there was a measurable increase in uncertainty, as different interpretations of the Committee's unusual action were debated across the wires.

This episode highlights the difficult balance which the mature Committee needs to strike between innovation and predictability. Today's Committee members — only one of whom has been there since the beginning — quite reasonably do not want to be unduly constrained by the habits of their predecessors. But the passage of time has given 'the

Committee' a collective personality. So changing established patterns of behaviour requires at least as much care and explanation as in the early days of the framework.

Second, even if we have not changed our procedures very much over the past decade, other central banks have. They have become much more transparent. And the debate about how much central banks should communicate — and how — has moved on, among academics, central bankers and central bank watchers.

For example, a long-standing issue is how much central banks should say about their expectations of future interest rates. The traditional concern has been that commentators would mistake a projection for a commitment, the risk being that when interest rates did not change as projected this would be damaging to credibility.

However, in recent years other central banks have moved increasingly towards giving indications about the likely path of interest rates, given their forecast for the economy. Some inflation-targeting central banks — Norway, New Zealand and Sweden — are now publishing charts which show how they expect to change policy rates to achieve their targets.(1)

Should the MPC follow this trend? If you follow press reports of our regular *Inflation Report* forecasts, you might be forgiven for thinking we already have. But actually no: our forecasts take market expectations for interest rates as their starting point, and we leave commentators to draw their own inferences. We have maintained the position that we do not give hints about future interest rate changes. Naturally we are looking closely at what happens elsewhere and we will want to learn from their experience — though of course, since the MPC is not a consensual body, it would be a significant complication to get it to agree an explicit path for interest rates.

Have we become prisoners of our past success?

Let me come, finally, to the biggest, and most difficult of the issues I want to raise tonight — namely the extent to which the stability of the past decade has conditioned expectations of what the MPC can and should do, in ways which may be both helpful and unhelpful to its ability to do its job.

The so-called Great Stability of the past decade has bestowed on the MPC the great gift of credibility — a golden halo which eluded monetary policy makers in the United Kingdom for most of the 20th century.

What part has the MPC played in its own success? It's difficult to say. But it is hard to believe that luck played no role. My own view is that the MPC has benefited from a virtuous circle. As we have kept inflation close to target, people have increasingly come to expect us to do so in the future, and to act on the assumption that inflation will stay low. These expectations have underpinned the wages they have bargained for, and the prices they have set. And that behaviour has helped us to keep inflation under control in the face of destabilising events.

However, the unusual degree of stability, and the prestige it has conferred on central bankers, may also have bred some less helpful attitudes: such as complacency about the ease with which the economy can absorb shocks, and unrealistic expectations about what monetary policy can achieve. Just to be clear: monetary policy can pin down average inflation over the medium term. It can not deliver inflation at target at all times and in all circumstances, and certainly not in combination with rock steady growth in output.

Let me illustrate these points by looking more closely at one of the key challenges I mentioned earlier, the impact of higher energy prices over the past two years.

Since 2004, global oil prices have more than doubled, a far sharper rise than at any time since the 1970s, when as some of you may recall, inflation took off, eventually peaking at 25%. Then, last winter, UK wholesale gas prices surged, as a result of supply and storage problems that were, in large part, specific to our market. The resulting increases in household gas and electricity bills have had a large direct impact on inflation. By December, they alone were directly contributing 1 percentage point to the measured inflation rate.

These energy price shocks are now starting to unwind, at least for now. The oil price has fallen back, although the outlook remains uncertain — the thin margin of spare capacity continues to make oil prices unusually sensitive to all kinds of news, from politics to weather and supply. We can have more confidence that the gas price shock is ebbing. The temporary supply and storage issues which caused the price spike last winter have been addressed. Together with a milder winter, this has helped to bring wholesale prices back to where they were two years ago, and retail prices have started to fall back.

So, just as energy price increases have boosted inflation over the recent past, it now seems likely that energy price falls are going to reduce it — possibly quite sharply — over the year ahead. Indeed we expect inflation to fall below the target by the end of 2007.

Let me make two observations about this episode.

(1) In addition, the Bank of Canada now includes text in its monetary policy report which indicates whether or not rates will have to change from their current level to meet the inflation target.

First, looking back over the past three years, the big picture is that inflation has stayed surprisingly low, and output growth remarkably stable, given the scale of these cost increases. Inflation has never deviated by more than 1 percentage point from the 2% target.

But second, judging by the media and public reaction to the rise in inflation over the past few months, it is clear that even a small deviation in inflation from target can now look very significant after the stability of the past decade.

This illustrates both the helpful and unhelpful legacy of a decade of remarkable stability for the UK economy.

On the helpful side, there is no doubt that a highly credible monetary policy framework has helped to contain inflation, in the face of a very large cost shock. The United Kingdom has become a low inflation economy since the 1970s and people expect the MPC to keep it that way. That affects the way they behave when they take decisions about wages and prices.

The less helpful legacy is that even a small movement in inflation away from target — 1 percentage point — has prompted some highly coloured media coverage, and may have unsettled people's expectations about where inflation is headed in the short run.

How does this less helpful legacy affect the policy debate?

Remembering the earlier discussion of constrained discretion, a temporary spike in inflation, as a result of a large cost shock like the recent rise in energy prices, is exactly the sort of shock to which policymakers should be able to react flexibly within an inflation-targeting framework. That enables them to avoid excessive volatility in output and employment, as long as public expectations of inflation over the medium term remain pegged to the inflation target.

On the other hand, the MPC can never afford to ignore evidence that medium-term inflation expectations are becoming dislodged: anchoring these expectations is fundamental to the success of the framework. But direct evidence of inflation expectations is very hard to come by; the measures we have are patchy and poor.

So there is a difficult dilemma here, which the MPC has been grappling with over the past few months. And it has left me with a nagging worry. My concern is this. If the price of maintaining the public's confidence is that we have to try to keep inflation within a whisker of the target at all times — even in the face of very large shocks — the flexibility that is such an important feature of our present arrangements may get significantly eroded.(1)

That is why the Open Letter procedure remains important — and why it is a great pity that it has been widely misrepresented as a punishment, rather than as an opportunity for the MPC to explain itself.

Our monetary policy framework can only offer flexibility as long as it remains credible. But our credibility needs to reflect reality. It is important that the unprecedented stability of the past decade does not lead people to believe that central banks can walk on water. They can't. When that becomes clear — as at some stage it will — I see some risk that people will be excessively disillusioned.

So let me end by being very clear about what I regard as reality. The MPC cannot keep inflation exactly on target, at all times and in all circumstances. Large price shocks will sometimes drive us away from target, and we need to be able use our judgement in deciding how to react. But we can and will keep inflation close to target on average. Short-run deviations from the target should not leave anyone in any doubt about that.

Conclusions

The stability of the period since 1992 has been almost as unexpected as the falling of the Berlin Wall, and every bit as welcome. It remains something of a puzzle and we cannot assume it will continue indefinitely.

We do not know quite how big a part the MPC has played in achieving this outcome. But it has certainly been shaped by it. Success — however earned — has its price. It may have bred expectations of the MPC and what monetary policy can deliver which are frankly unrealistic — and unsustainable in the longer term.

In the original concept, the defining characteristic of inflation targeting and the MPC was the scope it offered for exercising constrained discretion. We need to hang on to that big idea.

(1) I would have a similar concern if people came to believe that the MPC could keep output growing steadily, quarter by quarter, irrespective of wider economic circumstances.

Pricing for perfection

In this speech,[1] given to a group of market participants, Sir John Gieve — Deputy Governor for financial stability — cautions that with implied volatilities and risk premia low by historic standards many markets appeared to be 'priced for perfection'. He notes that one factor that may have been driving down implied volatilities was the apparent popularity of selling deeply 'out-of-the-money' options, which equates to selling insurance to others against unlikely financial market events. He concludes that given the rapid pace of innovation in financial markets and products, investors need to take particular care to understand the risks they are exposed to, and suggests that one approach would be to put greater emphasis on stress-test results as well as more conventional risk metrics.

Introduction

Many of you will have seen the new *Financial Stability Report* (*FSR*) that we published in July. Our aim in that *Report* was to set out more concisely and clearly than in previous years what we considered the main risks to the stability of the United Kingdom's financial system.

The bottom line was that the financial system looked pretty resilient to disturbances in the near term, but there were some underlying, longer-term, vulnerabilities lurking in the background. Some related to potential mismatches or mispricing in international financial markets. Others to extended balance sheet positions at home and abroad. And some reflected structural dependencies across the financial system, for example, on the smooth functioning of financial infrastructure. Our view was that they were unlikely to cause problems in the near future but there was a non-negligible risk that they could crystallise rapidly and disruptively for the financial system.

On past form we would be publishing the next *Report* this month but we have decided to change the publication schedule. Future *FSR*s will appear in the spring and autumn rather than summer and winter. So the 2007 editions are planned for late April and late October.

But in case four months is too long to wait, I want to use my comments today to set out our assessment of prospects for financial stability as we near the end of 2006.

Recent developments

Our view remains that near-term risks to UK financial stability are low.

That is mainly a reflection of the continuation of broadly benign macroeconomic conditions in the United Kingdom and globally. A rebalancing in global sources of growth does appear to be under way — and we are watching developments in the US economy and movements in the US dollar closely — but overall the global economy remains strong.

UK financial institutions' profitability and capital levels have remained robust, providing them with a buffer against future disturbances.

Financial markets have also demonstrated resilience over the past six months. Markets were turbulent at the time we were preparing the July *FSR*. It was unclear whether we were at the start of a significant correction. The subsequent rebound in asset prices, and declines in measures of volatility, showed that it was a pause not a sustained change in risk appetite.

More recently, we have seen huge losses at the Amaranth hedge fund. These losses exceeded those of LTCM, yet markets facilitated a smooth wind down in positions. That is reassuring though some questions remain about the capacity of markets to handle such a disturbance if the macroeconomic backdrop and the balance sheets of major institutions were less rosy. The incident may also raise some questions about how effectively market forces are acting to restrain those taking outsized risk positions, something that I will return to in a moment.

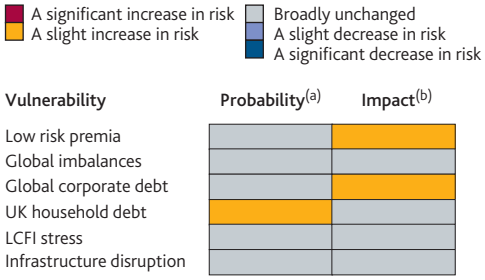
Taken together, these developments provide a strong baseline for financial stability. But the risks that we pointed to in July are still there. In particular, we pointed to the risk that

(1) Given at the Bank of England on 14 December 2006. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2006/speech295.pdf.

financial firms concerned about losing market share in rapidly expanding markets might pay less attention than they should to their resilience to unexpected shocks.

Chart 1 gives our assessment of developments since July. It shows that a number of the vulnerabilities have edged up a little as leveraged buyout (LBO) activity and commercial property lending have grown and as the number of personal insolvencies has increased. On the other hand, the slowdown in the US economy and the beginning of a narrowing in its trade balance may have reduced the risks on that side, although we didn't judge this material enough to change our overall assessment.

Chart 1 Net assessment of news since the July 2006 *FSR*



Source: Bank calculations.

(a) Assessed change in the probability of a vulnerability being triggered over the next three years.
(b) Assessed change in the expected impact on major UK banks' balance sheets if a vulnerability is triggered.

We know how easy and how fruitless it can be to draw up long lists of things that could go wrong without paying attention to their likelihood. So we try to take a balanced view that recognises not just what could go wrong but also recognises changes that we think have a positive impact on financial stability. For example, I have been clear that, in the long run, the growth of derivative markets and the development of new players like hedge funds should help to price risks better and spread them more widely, and thus make the financial system more resilient.

However, there is no denying that financial markets are liable to overshoot. And it is particularly important to stay alive to this risk when new records are being set for leveraged bids, returns on equity and City bonuses. Overoptimism in the financial system can have costs not just for the consenting counterparties but more broadly across the economy. By talking to you individually, drawing the threads together with our own analysis and feeding back a dispassionate but informed assessment of what your actions and plans add up to, we hope we can inform your decisions and thus help to head off instability.

Low volatility

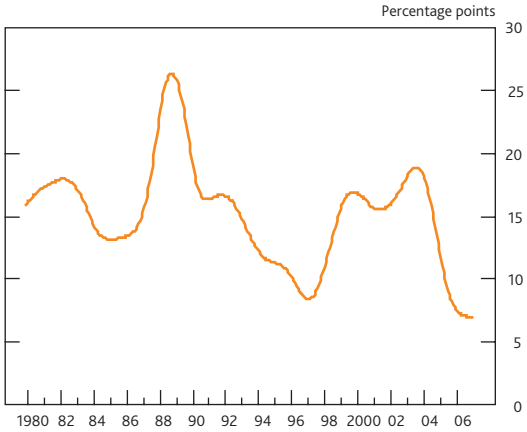
One of the main vulnerabilities on our league table is low risk premia in financial markets — that is, the low level of compensation that investors are demanding to hold risk. In my remaining remarks I want to offer some observations on a closely related and interconnected topic: the low level of volatility in a number of asset classes.

My colleague Paul Tucker has recently commented on low historic volatility. **Charts 2** to **4** show how the volatility of asset returns has come down for equities, bonds, and exchange rates to low levels by modern standards. One needs to go back to the Bretton Woods era to get volatility levels as low as at present.

Of course the reduction in the volatility of returns — and the lower compensation for future volatility embedded in risk premia — is responding to some real changes in the world. You might break down sources of uncertainty about future returns into three components: macroeconomic risks, financial risks and risks in the broader environment.

Macroeconomic volatility has fallen considerably over the past decade in many economies (**Chart 5**). In the real

Chart 2 Volatility of equity markets(a)(b)

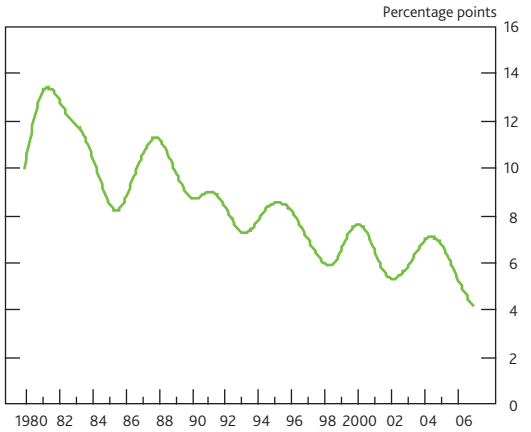


(a) Smoothed by Hodrick-Prescott filter.
(b) Average of S&P 500 and FTSE 100.

Chart 3 Volatility of foreign exchange markets(a)(b)

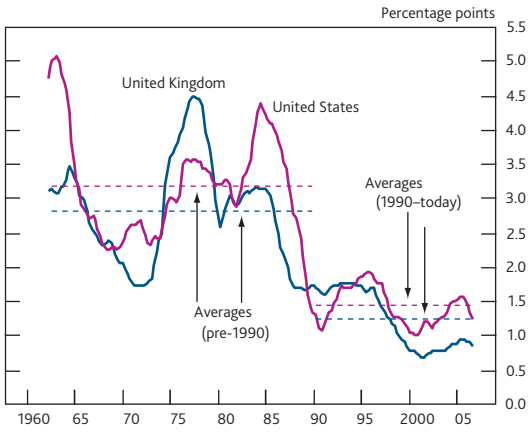
(a) Smoothed by Hodrick-Prescott filter.
(b) Average of USD/GBP, JPY/USD and EUR/USD.

Chart 4 Volatility of government bond markets[a][b]



(a) Smoothed by Hodrick-Prescott filter.
(b) Average of US, UK and Japanese ten-year bonds.

Chart 5 Macroeconomic volatility[a][b]



(a) Five-year average.
(b) Smoothed one-year rolling-window realised volatility of annual real GDP growth.

economy, greater flexibility in labour and product markets, especially openness to foreign competition through trade and immigration, has enabled smoother adjustment to shocks. On the price side, central bank independence and inflation targeting have contributed to greater price stability.

There is also greater depth and sophistication and fewer rigidities in financial markets. Innovation has created a variety of products enabling more and better risk transfer by financial market players and greater choice for end-investors. Greater financial market flexibility can support macroeconomic stability by keeping credit and liquidity available during periods of stress.

But risks in the broader environment haven't gone away. Threats from ecological or biological disasters, fraud, political conflict and terrorism seem as high as ever. And these are risks we have identified. As ever there may be some significant 'unknown unknowns'.

So while there are some good reasons for the reduction in financial risk premia significant risks do remain. The question is how well are they priced? Are there any reasons for thinking that markets may be underpricing risk? I think there may be.

Low risk premia and low volatility

Sustained low economic and financial market volatility is bound to have implications for the level of compensation for risk that investors require in asset prices.

In theory if assets become fundamentally less risky, then investors should receive a capital gain but should accept a lower future rate of return. If there have been signs of the capital gains, it is less clear that investors have revised down their expectations of rates of return on their portfolios. Indeed the pressure is to go beyond performing relatively well against your peers and to produce absolute returns. This has been fuelling a fierce search for yield and for 'excess returns' by asset managers who have to respond to this demand. Delivering on such a commitment in a world of low volatility takes impressive stock-picking skills; buying or selling mispriced assets and spotting emerging trends before the rest of the market.

Clearly not everyone can beat the market. Some asset managers will be able to do so for a while either through luck or good judgement and their challenge is to keep ahead — often with the extra funds that their performance has attracted. Their competitors face added pressure to catch up. Both are bound to be tempted to take on greater risk to generate absolute returns.

Of course this syndrome is widely recognised. Investment mandates and management remuneration are often measured against a risk-adjusted benchmark to avoid rewarding such activity. But it can take considerable efforts to spot such behaviour. The proliferation of new and highly complex financial instruments is making it harder to assess the incidence of underlying risk. The assumptions underlying the valuation of positions in such instruments are often unclear.

Many of these products have the effect of selling insurance against unlikely financial market events. Insofar as there has been a genuine increase in the stability of the economy and financial markets, selling volatility is less risky than it used to be. But it can be more risky than it appears.

Our market contacts often cite the example of selling 'out-of-the-money' options as a popular strategy recently. Here the seller receives a steady stream of small payments today in return for paying up in the unlikely event that the price of an underlying instrument moves significantly from its current value. With sufficient leverage, a small payment stream can be turned into a tidy return. But as all insurers

know, the key to long-term return is to spread your risks widely or to avoid correlated risks.

In assessing risk in financial markets, a common metric is correlation of positions with the market return. But this is quite inappropriate in this case. The value of a 'deeply-out-of-the-money' option has relatively low correlation with movements in the price of the underlying instrument or the market generally. So a simple measure of riskiness based on historical correlations will mistakenly show a leveraged out-of-the-money option trade as providing a good risk/return trade-off. In the jargon, selling volatility protection can be one way to generate 'beta disguised as alpha'.

One would usually expect that any mispricing of risk here would be counteracted by market forces. Countervailing strategies — buying volatility — should be profitable in the long run. The problem is that it requires patience, persistence and deep pockets. Going 'long' volatility means being prepared to make regular small payments and hoping to be compensated by a large irregular pay-off. In a world of short-run return targets, it is not surprising to find this is unpopular.

If mispricing of this sort is under way it would show up in higher asset prices and lower implied volatilities across a range of markets. And implied volatilities are at or around historic lows in equity markets, bond markets, credit markets and foreign exchange markets (**Charts 6–8**) despite the market turbulence during May and June and recent rumblings on the dollar.

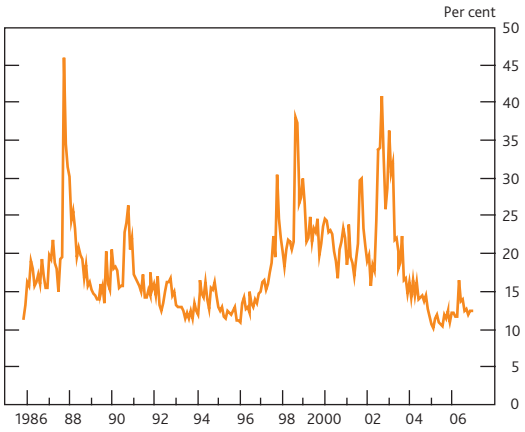
Implications of low risk premia

These low levels of implied volatility — and associated low level of risk premia — can have real implications for the economy and the stability of the financial system.

In the corporate sector, for example, low risk premia may be one factor that has supported the rapid growth in private equity backed LBOs (**Chart 9**). Spreads on high-yield corporate debt have narrowed sharply in recent years, to the point where there seems very little compensation for credit risk, and almost none for liquidity risk (**Chart 10**). A combination of squeezed corporate credit spreads and low reference risk-free government yields has resulted in the lowest nominal cost of borrowing for corporates since the 1950s.

In the July *FSR* we included a rough estimate that — other things equal — LBOs in 2004 and 2005 would raise the future probability of corporate default by 20 basis points. Given recent activity we now estimate it will add around 40 basis points over coming years relative to the current average probability of corporate default of about 2.0%. Given the funds already raised by private equity firms, this might be expected to increase further in 2007.

Chart 6 Implied equity market volatility[(a)]

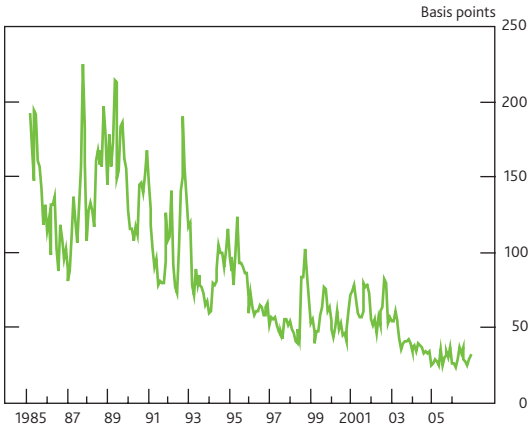


(a) Average of S&P 500, FTSE 100 and Euro Stoxx.

Chart 7 Implied foreign currency volatility[(a)]

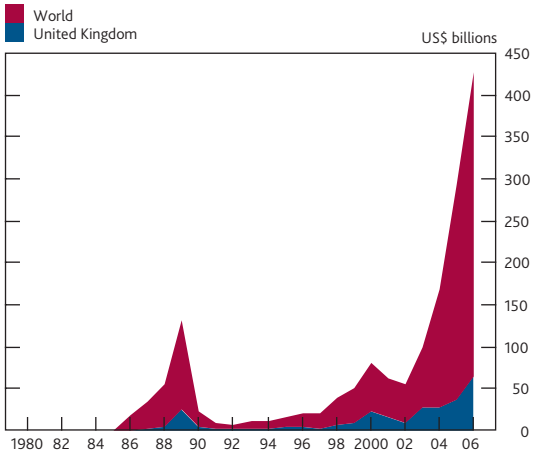
(a) Average of USD/GBP, JPY/USD and EUR/USD.

Chart 8 Implied interest rate volatility[(a)]



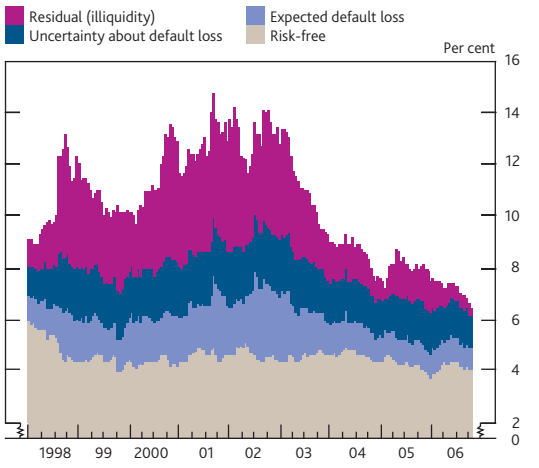
(a) Average of Euribor, eurodollar and short sterling.

Chart 9 LBO debt issuance[a][b]



(a) LBO issuance is defined here as a subset of syndicated leveraged issuance, where syndicated leveraged issuance is defined as syndicated sub-investment grade or unrated debt with a spread over Libor in excess of 150 basis points.
(b) 2006 data up to 20 November.

Chart 10 Credit spreads[a]

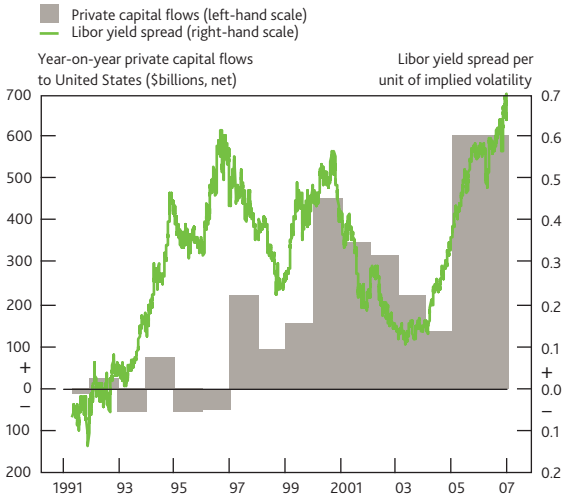


(a) Twenty-year cost of borrowing for UK high-yield corporates.

Furthermore, there is anecdotal evidence that other corporates have increased leverage in defence — taking the view that it is imprudent to be 'under-geared' in an environment where private equity firms are flush with cash. Indeed, the CFO of one FTSE 250 company which geared up significantly to avoid being taken over remarked that 'we have seen almost no drawbacks from being junk'.

Another example of low implied volatilities and risk premia affecting risk-taking occurs in cross-border capital flows. In this case, low implied volatilities on interest rates and exchange rates can support cross-border carry trades because the yield pickup looks attractive when you can hedge the worst risks quite cheaply (**Chart 11**). The continued smooth financing of global imbalances through these carry trades in turn leads to low volatility. But this can of course work in reverse. Foreign exchange volatility has jumped up since the US Thanksgiving Day holiday. If this volatility were to persist the perceived risks in the carry trade would increase.

Chart 11 Yen-funded dollar carry trade 'attractiveness index'



The common characteristic of these examples is that low implied volatilities reduce the apparent riskiness of portfolios and can encourage investors to take on more risk. And if implied volatilities are not a good measure of future volatility, they will end up bearing more risk than they expected.

Avoiding this pitfall requires diligent risk assessment by investors and other counterparties. That is what is needed for market discipline to do its work. It requires both adequate disclosure of risk-relevant information and its effective use in investment decisions. In the case of the hedge fund sector, for example, it seems likely that greater institutional investor interest will continue to raise the bar on disclosure requirements, particularly for those generating returns using complex products where traditional measures like Value-at-Risk (VaR) may fail to capture fully the underlying risks.

Conclusions

To conclude, our overall assessment remains benign. The financial sector is strongly capitalised and well placed to handle even large shocks like Amaranth. The rapid pace of innovation in financial markets also promises better and wider distribution of risk which is good not just for the financial sector's stability but should support more risk-taking in the real economy. Greater investment could deliver stronger medium and long-term growth.

But there remain a number of sources of vulnerability in the world economy and in financial markets which firms need to bear in mind.

Volatility is low, and as time passes longer memories are needed to remember when it was high. While there have

certainly been improvements in macro performance in recent years, I do not know a central banker who is not surprised at the faith that markets appear to have in us to keep the great stability going. And the risks in the wider environment are as great as ever.

It is not clear to me that these risks are fully priced into the market. Market forces may not have been able to correct any excess optimism given the incentives and constraints of participants operating in a world with a good deal of opaqueness about risk-taking.

In closing, I would stress that I am not saying market participants should avoid risk. But I do think it is important that market participants recognise that risk has not gone away, and that there are limits in the ability of financial engineering to insulate the financial system in aggregate against risk. Given the rapid pace of innovation in financial markets and products and the low level of risk premia, investors may need to take particular care to understand the risks they are exposed to. More than in the past, they may need to ask some searching questions about how funds are being invested and how risks are being managed. One approach might be to put greater emphasis on stress-test results as well as more conventional risk metrics. Failure to ask probing questions could prove costly for those directly involved — and, of greater concern, to others in the system — as and when the credit cycle turns.

Risks to the commercial property market and financial stability

In this speech,[1] Nigel Jenkinson,[2] Executive Director for financial stability, discusses risks to the financial system from the commercial property market, which in the past has been particularly vulnerable to any cyclical deterioration. He concludes that although there are currently similarities with previous booms, including sharp price rises, there are also important differences, including the benefits of continued financial market innovation. Against this background, it is prudent to monitor market conditions closely and to stress test portfolios against adverse outcomes.

Brief recourse to the history of Brighthelmstone, or Brighton as we now know it, reveals a turbulent past. In 1514, the town was burnt to the ground by French raiders, while 1703 saw many houses washed away during a great storm. In 1984 the world was shocked when IRA activists bombed the Conservative party conference in this hotel. And most recently it has seen the demise and gradual collapse of the iconic West Pier, which was finally declared beyond repair just over two years ago. Yet against this background, the town has been transformed from a small fishing village to the highly fashionable city we find ourselves in today. This picture of rapid growth punctuated by occasional major, adverse events is closely related to the topic I wish to discuss today.

The commercial property sector has a similarly turbulent history, at least over the most recent past. Periods of sharp and dramatic appreciation in capital values have been frequently followed by periods of significant decline. And, in several cases, these episodes have been associated with wider financial system stress. The early-1990s crash in the commercial property market, which contributed to the wider economic downturn, was precipitated by rapid price and lending growth not dissimilar to that in evidence today. During this downturn, 25 of the so-called 'small banks' either closed or failed.[3] And stresses in the commercial property sector have also contributed to broader financial strains in other countries for example in the United States in the early 1990s and more recently in Japan.

As you know, current market conditions are very buoyant, with recent returns substantially higher than the long-term average and defaults on commercial mortgages infrequent. Given the historical experience, it is valuable to stand back and consider whether such buoyant conditions are leading to an increase in risks which could trigger a rapid change in market sentiment and broader financial strain at some point.

At the Bank we focus on achieving monetary stability and financial stability, which together constitute our two so-called 'Core Purposes'. The achievement of monetary stability centres around the setting of interest rates on a monthly basis by the Monetary Policy Committee in order to meet the inflation target set by the Chancellor. And with our colleagues at HM Treasury (HMT) and the Financial Services Authority (FSA) we work to maintain financial stability through the tripartite Standing Committee on Financial Stability.

The setting of monetary policy is necessarily forward looking, given the speed with which changes in interest rates impact on the economy. So it is expectations of how the macroeconomic environment will look in the medium term that determine current interest rates. And the macroeconomic outlook is relatively benign at present.

Within our financial stability remit we focus primarily on downside risks. In particular, we look for whether there are vulnerabilities or weak points in the financial system that could, in unlikely but nonetheless plausible circumstances, generate serious disruption to either financial markets or to the financial system more broadly, with potentially widespread economic costs. In addition to improving the tripartite Standing Committee's knowledge of these risks, we hope, through publications such as the Bank's regular *Financial Stability Report*, to help financial firms and the wider public in managing and preparing for these risks. Where appropriate, we work with the FSA, HMT and other authorities to improve the robustness and resilience of the UK financial system. And we also work on strengthening contingency planning and crisis management arrangements in preparation for the worst, should it occur.

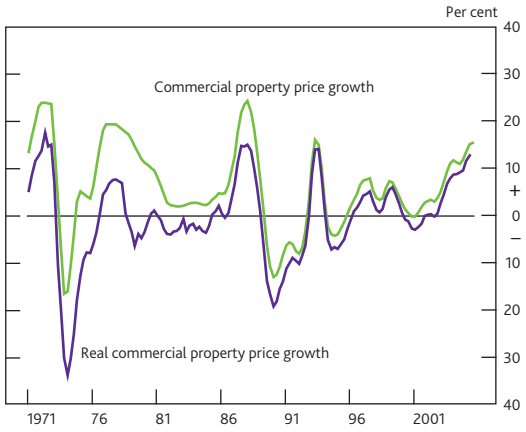
(1) Given at the IPD/IPF Property Investment Conference, Grand Hotel, Brighton, 30 November 2006. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2006/speech293.pdf.

(2) I am very grateful to my colleagues Sarah Fish and Rob Hamilton for their help and assistance and to Ian Bond and Mike Cross for helpful comments.

(3) See Logan, A (2000), 'The early 1990s small banks crisis: leading indicators', Bank of England *Financial Stability Review*, December, pages 130–45.

As I mentioned earlier, commercial property has proved a source of instability in the past and is an area we monitor closely. **Chart 1** shows the volatility of price movements in the past and also highlights recent rapid rates of price growth (close to 15% annually in nominal terms), which have not been accompanied by a coincident increase in rental growth. Indeed the pace of price appreciation recently has driven yields to an historic low of 5.5%, almost half the level witnessed in the early 1990s (**Chart 2**). And, though the quantity of city office developments has fallen over the past three years, the quantity of development in the pipeline for the next three years is considerably higher (**Chart 3**), but still below the level seen during the late 1980s/early 1990s.

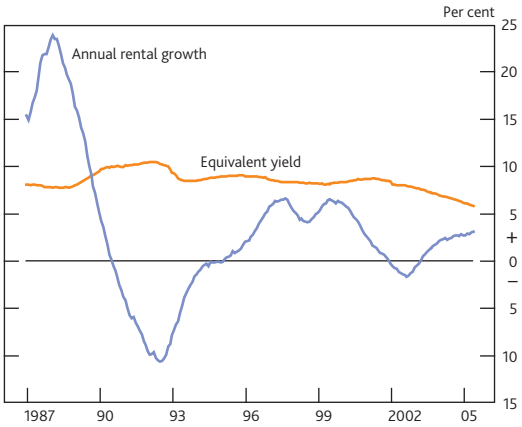
Chart 1 Commercial property price growth, 1971–2006(a)



Sources: Investment Property Databank and Bank calculations.

(a) A measure of real commercial property prices is obtained by dividing the IPD All Property Capital Values Index by the GDP price deflator.

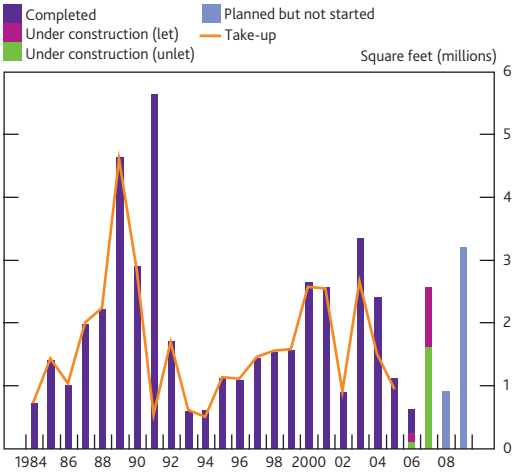
Chart 2 Equivalent yield and annual rental growth, 1987–2006



Source: Investment Property Databank.

While the sustainability of these trends is of natural concern to those active in the commercial property sector, the apparently exaggerated buoyancy of the market would not be viewed as a potential source of risk to the UK financial system as a whole if the market were small in financial terms. But as we know, this is not the case. UK banks' lending to the commercial property

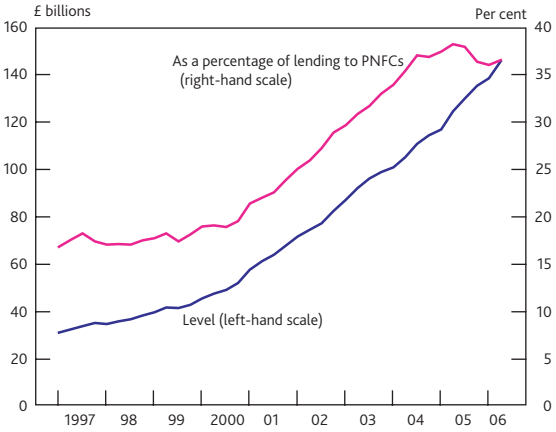
Chart 3 Development pipeline — city offices



Source: CB Richard Ellis.

sector has risen rapidly in recent years, increasing by more than 15% during the past year and quadrupling since 1997. The sector now accounts for over a third of lending to private non-financial companies (or PNFCs), twice the proportion of seven years ago (**Chart 4**). And property is also an important asset class for pension funds, insurance companies and other investors. So the fortunes of both investors and lenders have become more closely intertwined with the fortunes of the property sector over the recent past.

Chart 4 UK banks' lending to the commercial property sector, 1997–2006



Of course, the key question from a financial stability perspective is 'how likely is a market correction?'. In order to answer this question it is necessary to understand the forces behind recent market developments.

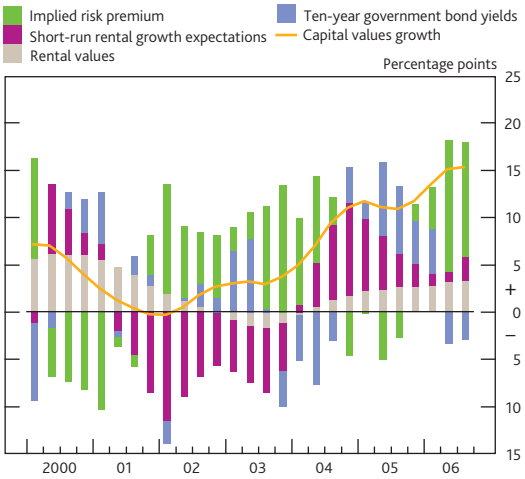
The past few years have seen large increases in asset prices in a number of markets. As discussed in our most recent *Financial Stability Report*, this may partly reflect a manifestation of the generalised 'search for yield' in the face of low interest rates and wider macroeconomic and monetary stability. The increase in the quantity of money being invested in markets in

search of higher returns has acted as a catalyst for financial innovation, evidenced by rapid growth in securitisation activity and in structured credit markets more generally. From a financial stability perspective, the broadening of the investor base both domestically and internationally associated with the development of new credit transfer products and the introduction of increasingly sophisticated investment vehicles has resulted in a beneficial diversification of risk. A good example are real estate investment trusts, or REITs, whose securities are bought and sold on the major exchanges and therefore provide an accessible, liquid, property investment instrument. By extending commercial property investment opportunities to a much larger community of investors, while simultaneously minimising the concentration of exposures to individual investments and increasing trading opportunities, the introduction of REITs can be seen as a positive development from a financial stability perspective. And these structural developments, which have widened the investor base and increased commercial property demand, also help to account for some of the increase in prices. Banks' risk management practices have also improved in recent years, with closer monitoring of loans and greater use of stress testing. So, a number of factors may have reduced the likelihood of a sharp correction of the type experienced in the early 1990s.

That said, the extent to which recent trends have affected potential market dynamics in the event of a rapid change in market sentiment is yet to be seen. For example, the recent growth in securitisation activity within the commercial property sector may have reduced the probability of stress on account of the associated diversification in risk, but if strain in the sector were to occur then uncertainty over where the underlying credit exposures actually lie, and how 'new' investors will behave if their tranches are downgraded and/or they suffer credit losses, could make it more difficult to resolve.

And there are questions as to whether the generalised 'search for yield' has gone too far and led to a potential underpricing of risk in some asset markets. Certainly it is doubtful whether the structural changes described above can explain all of the recent increases in price growth, which have led to valuations becoming stretched in relation to their traditional determinants. The dividend discount asset pricing model provides one decomposition of the factors behind the increase in the rate of growth of capital values. As shown in **Chart 5**, the compression in our estimate of the risk premium has been one important factor. Another has been the fall in the discount rate: over the past year, the ten-year real government bond yield has fallen to its lowest level since index-linked gilts were first issued 25 years ago. And these trends may be partly related: low bond yields have encouraged investors seeking a given nominal return to invest in riskier assets — including property — driving up their price.

Chart 5 Dividend discount model decomposition of commercial property price growth, 2000–06



Sources: Investment Property Databank, Investment Property Forum and Bank calculations.

Although the model is simplistic and has clear limitations, the analysis also suggests that property prices could be at risk if bond yields were to rise and/or investors' risk appetite to fall significantly.

From a risk management perspective, the potential for a sharp adjustment should not be overlooked. Not least because fortunes within the commercial property sector can rapidly reverse, as I am sure you are all too aware. This is demonstrated by the fact that the fraction of quoted property companies making a loss rose from zero to almost 30% between 1988 and 1992. And while the risk environment is clearly different now to then, it is important not to ignore the lessons of economic history. This is particularly important in a market such as commercial property, as experience of past episodes of stress in the sector becomes increasingly limited among active market professionals and anecdotal evidence tells us that new investors may be tending to over-extrapolate recent trends. Although unlikely, it is prudent to be prepared for severe adverse shocks either to the macroeconomy or to financial markets. These could trigger a sharp change in market sentiment and involve an abrupt end to the 'search for yield' phenomenon mentioned above. This in turn could lead to a marked change in financing conditions, with commensurate falls in property prices and difficulties in refinancing. The accompanying reduction in risk appetite would tend to result in a rapid widening of credit spreads and reduce the liquidity of some new capital instruments. By way of example, it is worth noting that US CMBS spreads jumped by more than 90 basis points in the two months following the announcement of LTCM's failure in September 1998.

Again, I wish to emphasise that such a scenario is improbable and does not reflect our beliefs about the most likely outcome for the commercial property sector. But it is sensible to consider adverse outcomes and to stress test portfolios when managing risk exposures.

Clearly the world has changed somewhat since we last witnessed significant stress in the commercial property sector. The main developments — greater macroeconomic stability, and innovation to improve the capacity to manage, hedge and diversify risks — should I believe be viewed in a positive light from a financial stability perspective. And as I outlined earlier, the central macroeconomic outlook is benign at present, with risks on both sides broadly balanced. Nonetheless, the exceptional buoyancy of recent conditions in commercial property markets and the associated rise in leverage do suggest some build up in vulnerabilities, and so warrant careful risk management by market professionals.

Macro, asset price, and financial system uncertainties

In this lecture,[1] Paul Tucker,[2] Executive Director for Markets and Monetary Policy Committee member, discusses three related 'arenas' of uncertainty concerning the impact of structural changes in the economy and financial system. Beginning with the macroeconomy and against the background of his vote at the Monetary Policy Committee's November meeting, he looks at the challenges confronting policymakers from supply-side changes in the United Kingdom such as migration and globalisation, and stresses that the response of policymakers depends crucially on whether medium-term inflation expectations are well anchored. After exploring possible explanations for the volatility of financial-asset returns having fallen by rather less than macroeconomic volatility, he considers the limited degree of forward-looking uncertainty about asset prices implied by financial option prices. Noting that part of the explanation may lie in developments in the structure of the financial system, and in particular the process of disintermediation of the banking system, he examines the implications for assessments of money and credit conditions and of the resilience of the financial system as a whole. Bringing those uncertainties together raises questions about how markets and the system would respond if some of the risks to the outlook were to crystallise. Though the answers are unknowable, he emphasises that central bankers must strive to maintain the medium-term credibility of monetary policy; and must understand today's global banking system and capital markets well enough to tell the difference between a problem requiring solely a macroeconomic response and a more complex financial stability problem.

It is a great privilege to give this lecture, named in honour of Roy Bridge, for many years a very distinguished head of foreign exchange at the Bank of England and the first President of your association, the ACI.

The world in which Bridge worked was so very different from ours that, although my responsibilities cover the same part of the Bank, I cannot really imagine what he would have made of three striking features of the current environment which I plan to review this evening.

First, while monetary authorities are commonly given some of the credit for the return of macroeconomic stability, central bankers themselves devote a great deal of effort to conveying what they see as risks to the outlook. Second, while some distinguished commentators see a puzzle in lower macro volatility not having been matched by an equally large decline in asset price volatility, central bankers by contrast worry publicly that many financial asset prices imply unusually low future volatility. And third, while central bankers and others in the official sector celebrate the gains in risk transfer and efficiency brought by recent changes in the structure of the financial system, they also issue warnings about associated threats to systemic stability.

These three arenas of uncertainty — macroeconomic, financial asset pricing, and the financial system — are of course intertwined, but I shall initially find it convenient to unbundle them.

(1) Given at the Roy Bridge Memorial Lecture delivered on 11 December 2006 at the ACI — Financial Markets Association Annual Conference, Honorary Royal Artillery Company, London. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2006/speech294.pdf.

(2) I am grateful to Thomas Belsham, Nicholas Vause, Lewis Webber and Jing Yang in the Financial Stability area; Matt Davies, Alex Haberis, Ben May, Kalin Nikolov, Rupert de Vincent-Humphries and Tony Yates in the Monetary Analysis and Statistics area; and James Lindley, Philip Thomas and James Wackett in the Markets area. For background work to Damien Lynch, and for secretarial support to Katherine Bradbrook.

Macroeconomic and monetary policy uncertainties

The characteristics of the Great Stability, as some economists call it,[1] are by now familiar. Essentially, low inflation on average; much less persistence in deviations of inflation from central banks' explicit or implicit targets; and much lower volatility in both output growth and inflation.[2] Some of the credit is typically given to better monetary regimes, and I believe it should be.

Yet policymakers also stress a wide range of uncertainties, threatening at least interruptions to the benign conditions of the past decade or so. This is not just an occupational disposition of central bankers. To varying degrees, these uncertainties do feature in real-world policy debates. I have argued previously[3] that some risks — such as those posed by global current account imbalances — could not sensibly be factored in to policy settings ahead of their crystallising. But uncertainties about the structure of the economy and how monetary policy works do somehow have to feature in our policy judgements, as I can illustrate with the thinking behind my vote at the MPC's November meeting.[4] Essentially, I balanced two quite different, but quite likely, views of the outlook, which I shall label Orthodox and Alternative.

Under both stories, private sector demand growth has been reasonably robust and looks, according to surveys and the Bank's regional Agents, to continue to be robust for a little while at least. Notwithstanding the US slowdown, world growth weighted for its significance to UK trade has remained solid, due largely to recovery in the euro area. Business investment appears to be recovering. And consumption, although in the near term subject to upside risks from the housing market but downside risks from household debt, looks most likely to grow close to its average rate. Surveys and anecdotal information point to firms operating close to capacity, but profit margins have been squeezed in recent years, essentially by the rise in energy prices. There is some slack in the labour market. That is deliberately broad brush; the point is that it is common to both stories.

On the Orthodox Story, in conditions of robust aggregate demand, firms operating close to capacity are likely to take opportunities to restore their margins by raising prices, pushing upwards on CPI inflation. So the Orthodox Story commanded a policy response to prospective inflationary pressures from excess demand.

Under the Alternative Story, the outlook for inflation may be quite different due to developments in the labour market, notably from inward migration. There might well be more slack in the labour market than allowed for in the Orthodox Story. And, most potently, if more workers were to be attracted in to the country as aggregate demand expands, the economy's productive capacity would expand as well. In that case, it would probably be harder for firms to raise prices, although they may still be able to restore margins by bearing down on costs, especially labour costs. (That is in aggregate; we would probably see further increases in skill shortages and in the premium for highly skilled labour in the professions.) On the Alternative Story, the outlook for inflation is highly uncertain — and not necessarily weaker, although that may seem the most obvious implication.

Indeed, under the Alternative Story, there could well be challenges for monetary policy, which in its modern mode operates essentially by using Bank Rate to regulate aggregate demand relative to aggregate supply, exploiting a short-run trade-off between growth and inflation so long as inflation expectations are well anchored. If aggregate supply were to become endogenous in the way I have described, the short-run trade-off might well be less pronounced for a while. That would make it harder to judge inflationary pressures from gauging the amount of slack in the economy; and harder for the Bank to achieve our 2% inflation target by broadly steering demand conditions. In that scenario, it would matter enormously that wage and price-setters continued to act on the basis that CPI inflation would remain in line with the 2% target over the medium term.

For me, both the Orthodox and Alternative Stories are plausible. In that sense, I think the outlook is 'bimodal' — in terms of there being two main stories. The Orthodox Story, to which I gave most weight in my November vote, required a small tightening. The implications of the Alternative Story for policy were less clear. I concluded that it was essential for the MPC to act in a way that was most likely to keep inflation expectations anchored. With headline inflation tangibly above target in the run-up to the main, New Year wage-bargaining season and with the market clearly expecting that policy would be tightened, a small increase in Bank Rate was, on balance, warranted to avoid any misperception that our reaction function had altered.

Strategically, the significance of this account is in the uncertainty injected by structural change; in this case, from migration. Of course, there is a host of demand-side uncertainties: about consumption, export growth and so on.

(1) In the United States, 'Great moderation' is preferred, because low inflation had been achieved in an earlier decade. Bernanke, B (2004), 'The great moderation', remarks at the meetings of the Eastern Economic Association, Washington, 2004.
(2) See Benati, L (2005), 'The inflation-targeting framework from an historical perspective', *Bank of England Quarterly Bulletin*, Summer, pages 160–68; and Tucker, P (2005), 'Monetary policy, stability and structural change', *Bank of England Quarterly Bulletin*, Summer, pages 247–55.
(3) Tucker, P (2006), 'Reflections on operating inflation targeting', *Bank of England Quarterly Bulletin*, Summer, pages 212–24.
(4) This lecture is being given before publication of the minutes of the Committee's December meeting, and so I am not at liberty to discuss my contributions to that meeting.

Table A Macroeconomic and asset price annual volatility[a]

	1951–59	1960–69	1970–79	1980–91	1992–2005	2002–05	Percentage change between 1960–69 and 1992–2005	Percentage change between 1980–91 and 1992–2005
UK GDP	1.5	1.6	2.2	2.3	0.9	0.7	-41.6	-59
US GDP	3.3	1.7	2.5	2.5	1.1	1.0	-36.4	-56
UK inflation[b]		1.5	5.5	3.4	1.0	0.4	-34	-72
US inflation	1.8	1.2	2.0	2.3	0.5	0.6	-55	-76
S&P 500[c]	14.0	15.7	19.1	12.0	15.2	14.3	-3	27
FTSE All-Share[c][d]		20.4	43.3	12.1	15.2	21.2	-25	26
Ten-year US Treasury bond[c][g]	3.4	5.4	7.8	15.4	9.6	6.9	78	-38
Ten-year UK gilt[c][e][g]		3.1	11.2	7.7	4.9	3.5	57	-36
Sterling exchange rate index[f]			6.9	4.5	2.3	1.0		-49
Dollar exchange rate index[f]			5.4	4.4	2.9	3.3		-34
Yen exchange rate index[f]			9.9	4.3	4.0	2.0		-8
Euro exchange rate index[f]			1.8	3.0	3.0	1.8		-3

(a) Volatility is calculated as standard deviation of annual growth rates.
(b) UK inflation is consumption deflator inflation. Data for 1960–69 includes data for 1956–59.
(c) Nominal returns deflated by consumption deflators.
(d) FTSE All-Share starts in 1962.
(e) 1960–69 includes 1956–59.
(f) Trade-weighted real exchange rate indices start in 1975.
(g) UST and UK gilts are based on total return indices from Global Financial Database.

But they fit comfortably into the MPC's framework of producing a conditional forecast of probability ranges around a central projection. The supply-side uncertainties are something else — much harder to calibrate and potentially going to how we read and act on the economy.

Inward migration is just the most obvious reason the monetary transmission mechanism might have altered. In reviewing globalisation more generally, others have described how the short-run relationship between aggregate demand and inflation may be weakened by firms' enhanced capacity to switch production between countries, including via outsourcing, in the face of capacity and cost pressures.

As policymakers discuss these issues[1] it could become a commonplace that, in such an environment, central banks would have no choice but to respond more aggressively whenever inflation deviates from target; that, compared with the past, we would need to make bigger changes in interest rates, since bigger shifts in demand would be needed to bring inflation back to target. I should make clear that, as put, I would not go along with this completely. It would all depend on whether medium-term inflation expectations were well anchored. So long as they were, the central bank would have a wider choice than a one-item menu of having, putting it crudely, to generate a material downturn in the short term to contain inflation; or, symmetrically, a boomlet to raise inflation. Another possible choice might be to tighten (loosen) modestly but for longer, allowing inflation to return to target over a longer horizon; and if the policymaker explained the considerations behind the likely path of policy, price and wage-setters might act in a way that helped to bring inflation back to target.[2] Acting aggressively without need could endanger the political economy foundations of any central bank's authority. It has to be a judgement based on the particular circumstances.

In terms of my central theme this evening, this is a world in which monetary regimes truly are better, but in which policymakers are having to face some fresh challenges.

Asset pricing uncertainties

If central bankers see possible interruptions to the Great Stability, there is arguably conflicting evidence as to whether financial markets are giving it insufficient weight or — at the opposite pole — taking stability for granted.

In an intriguing paper, Ken Rogoff has shown that output and inflation volatility have declined by considerably more over recent decades than the volatility of returns on a range of financial assets (**Table A**).[3] As Rogoff discusses, there could be a number of explanations. Financial markets might believe that the Great Stability will not last. Or it may be taking them a while to price in lower macroeconomic volatility. Or the beneficial effects of macroeconomic stability may be being offset by something else.

In the third category, Rogoff discusses the possibility that, with the lower level of risk-free rates that have accompanied the Great Stability, a given change in the yield curve now has a

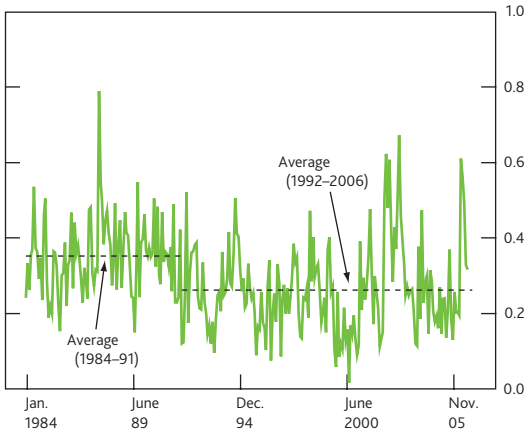
(1) For example, Bean, C (2006), 'Globalisation and inflation', *Bank of England Quarterly Bulletin*, Vol. 46, No. 4, pages 468–75.
(2) See Woodford, M (2003), *Interest and prices: foundations of a theory of monetary policy*, Princeton University Press, Chapter 7; Tucker, P (2006), 'Reflections on operating inflation targeting', *Bank of England Quarterly Bulletin*, Summer, pages 212–24.
(3) Rogoff, K (2006), 'Impact of globalization on monetary policy', paper prepared for a symposium on 'The New Economic Geography: effects and policy implications', Jackson Hole, Wyoming, August.

bigger proportionate effect on asset prices. I am not sure this would be my own best bet.

Common versus idiosyncratic volatility

But first, some facts. In the case of equity markets, we need to separate the dominant common (or macro) component of index returns from that attributable to variability in the firm-specific (or idiosyncratic) component. Comparing the period from 1980 to 1992 with that since 1992, when inflation targeting was introduced in the United Kingdom, the common component — proxied by the average correlation between returns on pairs of equity index components — has fallen by around 25%[1] (**Chart 1**). Forward-looking measures, derived from option prices, imply that these pairwise correlations are not expected to fall much further. All told, this seems consistent with some beneficial effect on asset volatility from the Great Stability, but with Rogoff's puzzle intact.

Chart 1 Average pairwise correlation between historical returns of FTSE 100 constituents

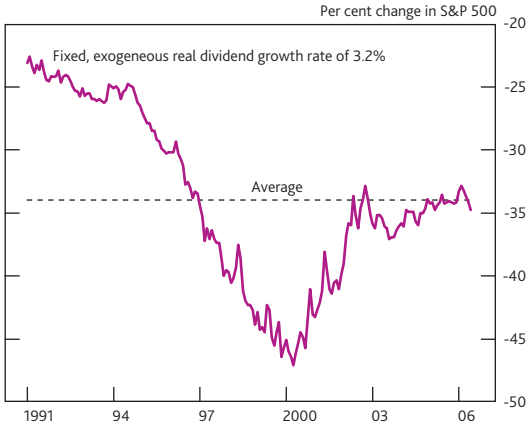


Source: Bank of England calculations.

Possible explanations: risk premia

Another vantage point can be gained from decomposing changes in the level of the equity market into changes in (estimates of) the risk-free rate, projected earnings growth, and the equity risk premium.[2] For both the FTSE 100 and the S&P, this suggests that the decline in real rates has been an important driver of the rise in the equity market since the early 1990s. But one feature of better monetary policy regimes has been that short-term risk-free real rates have been slightly less volatile than in the past, so it is not obvious that equity volatility would otherwise have remained higher than macroeconomic volatility due to fluctuations in risk-free real rates. Separately, such a decomposition suggests that the market is not materially more sensitive to changes in real rates now than it was on average over the past 15–20 years (**Chart 2**). One possible explanation is that the other component of the discount rate — the equity risk premium — may have risen since the late 1990s. If, as a result, the overall discount rate were broadly unchanged, a given shift in the default-free curve would not necessarily have a greater proportionate effect on equity prices than in past decades.

Chart 2 DDM sensitivity of S&P 500 to a 1 percentage point increase in the risk-free real interest rate



Source: Bank of England calculations.

Indeed, a bigger question would seem to be how to square the possibility of a rise in the equity risk premium with apparent falls, since the turn of the century, in term premia on default-free government bond yields and in credit risk premia across a wide range of assets. It must be cautioned that the true equity risk premium is unobservable, and so estimates may well be wide of the mark. But there is a possible story, related to changes in the global distribution and management of savings. The managers of the now massive official foreign exchange reserves in Asia have a clear preference for fixed-income securities, both absolutely and relative to say the US household sector. And in the West, defined-benefit pension fund trustees and managers have been placing greater weight on matching the duration of their quasi-fixed income liabilities with holdings of bonds. In both cases, there may have been a *de facto* shift in global demand from equities to fixed-income securities of various kinds. That would tend to alter relative risk premia.[3]

(1) As for the volatility in individual-firm equity returns, some extreme episodes aside (for example, the 1987 Crash), the firm-specific component inevitably dominates. For the UK market, the common component seems to have fallen slightly, on average, since 1992. The idiosyncratic component rose during the second half of the 1990s, but then fell back. On the face of it, that would seem to square with the dotcom/telecom boom and bust. At least for the UK market, it does not obviously lend support to the suggestion in some earlier papers that there may have been an underlying increase in idiosyncratic volatility. For example, see Campbell, J, Lettau, M, Malkiel, B and Xu, Y (2001), 'Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk', *Journal of Finance*, Vol. 56, No. 1 pages 1–43, which covered the period from 1962 to 1996 for the US market.

(2) Using a dividend discount model. Further information on the dividend discount model can be found in Panigirtzoglou, N and Scammell, R (2002), 'Analysts' earnings forecasts and equity valuations', *Bank of England Quarterly Bulletin*, Spring, pages 59–66.

(3) This is a different point from that, advocated for example by Chairman Bernanke, explaining a fall in long-maturity risk-free rates in terms of an *ex-ante* imbalance of global savings and investment. The two explanations are not mutually exclusive, as the observed fall in yields on indexed government bonds could reflect a combination of a fall in the risk-free rate and falls in term premia.

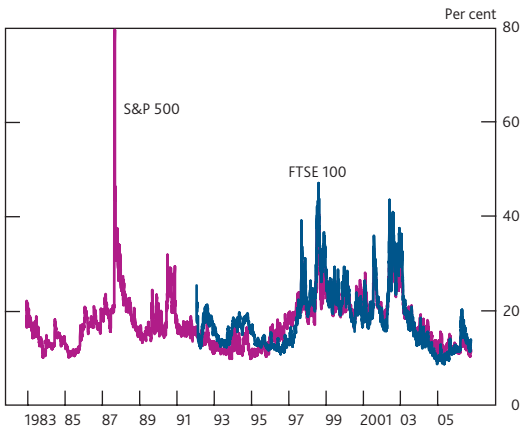
All told, this seems to reduce the candidate explanations for Rogoff's puzzle. For equities, fluctuations in equity risk premia may have been a factor, driven by the dotcom/telecom fad and shifts in global investor preferences. For financial assets more generally, perhaps the best provisional view is that volatility in asset returns may have been elevated for a while by the effect on prices of the reductions in default-free rates, term premia and credit risk premia associated with the Great Stability. As well as adding to volatility temporarily, that will also have raised *ex-post* returns, in which case it would be important that market participants did not act on the basis that they were easily sustainable.

Forward-looking uncertainty

This is where my own second puzzle kicks in: while we can busy ourselves trying to identify why realised asset price volatility has not fallen more over the past decade, central bankers seem to expend quite a lot more energy worrying about the low level of future volatility implied by options on a range of financial assets.

So, on the one hand, members of my community variously enumerate risks from low risk premia and the search for yield; global imbalances; energy prices; household balance sheets and house prices in a number of countries; releveraging of the corporate sector via leveraged buyouts; flatter Phillips curves; and so on.(1) On the other hand, implied volatilities derived from options, with a range of expiry dates, on long-term yields, equities, and exchange rates are all well below levels around the turn of the century (**Chart 3**). And in recent months, at least for short expiry options, they have dipped below the averages for the first part of the 1990s.

Chart 3 Equity index three-month option-implied volatility



Source: Bank of England calculations.

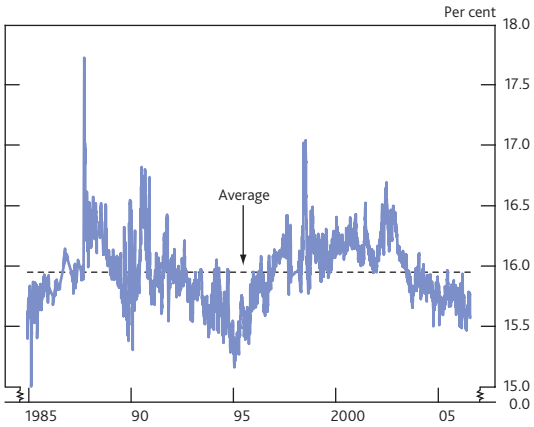
But implied volatilities may not be the best measure of the market's forward-looking assessment of risks. They represent one standard deviation (sd) in the market's underlying probability distribution, whereas arguably central bankers are worrying about greater-than-one standard deviation events. The market's assessment of such risks can perhaps be gauged by looking at how much of the current option-implied distributions lie beyond one sd compared with option markets in the past, and with historical outturns.

For bonds and equities, a little bit more of the probability mass implied by options(2) is currently in the lower tail (beyond one standard deviation) than is the case over fairly long runs of historical outturns(3) (**Table B**). But for equities, bonds, and dollar exchange rates, the lower probability mass is pretty well in line with the average 'tail' implied by options markets in the past (**Charts 4** and **5**). That does not suggest much sensitivity to the various risks preoccupying the official sector.

Table B Probability masses in financial asset option-implied and historical distributions

Asset	Tail	Option-implied tail	Historical tail	Historical period
USD per GBP	Upper ($ negative)	15	16	1971–2006
JPY per USD	Lower ($ negative)	15	16	1971–2006
USD per EUR	Upper ($ negative)	15	14	1971–2006
S&P 500	Lower	15	11	1931–2006
Ten-year UST	Lower (ten-year yield negative)	15	10	1960–2006

Chart 4 S&P 500 returns: probability in lower implied pdf tail more than one standard deviation from the mean (three-month horizon)



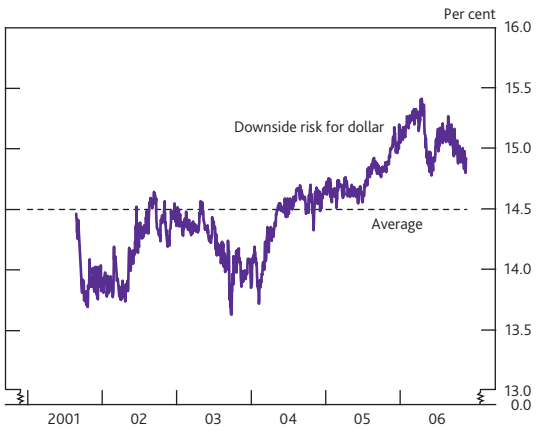
Source: Bank of England calculations.

Market contacts offer various explanations for this — some of them, I should make clear, sceptically. One — and here bear in mind my earlier remarks — is that not much really nasty will happen given the collective wisdom of the world's monetary authorities. Another is that, in an environment where investors are chasing yield, collecting the premium income

(1) For example see Bank of England *Financial Stability Report*, Overview, July 2006, pages 5–13 and *Inflation Report*, November 2006, Section 5.
(2) Using three-month expiry options.
(3) Since the 1930s for equities; 1960s for bonds; and 1970s for exchange rates.

from writing options has become a prevalent way of sustaining returns in the hope that nothing too bad happens; and that if it does, today's liquid capital markets will contain the volatility anyway. In other words, they base their explanation for low option-implied volatility on what has been going on in the structure of the financial system.

Chart 5 JPYUSD: probability in lower implied pdf tail more than one standard deviation from the mean (three-month horizon)



Source: Bank of England calculations.

Financial system uncertainties

Big, perhaps fundamental, changes have been under way in banking and capital markets for a few years now, with implications for how we gauge money and credit conditions, and assess the resilience of the financial system as a whole.

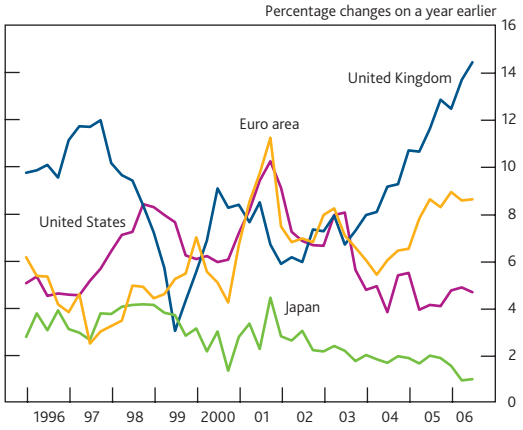
Discussions typically jump to the second, financial stability issue. But I want to look first at some monetary indicators in the light of these structural changes.

Broad money growth

As has recently attracted a good deal of attention, UK broad money is up around 15% on a year ago, and more than 25% since the beginning of 2005 — much more than elsewhere in the G7 (**Chart 6**). Of this increase, almost half — or around £140 billion — is accounted for by the money holdings of so-called Other Financial Corporations.(1) Central bankers have to ask whether that represents a threat to inflation and stability or, rather, a shift in the demand for money that is a symptom of structural change in the financial system.

There is relatively little research on the macroeconomic significance of OFC money.(2) The central question is typically seen as whether institutional investors, such as pension funds and life insurance companies, are holding an unusually large amount of money in their asset portfolios, in which case any 'excess' might be expected sooner or later to flow into financial markets, pushing up asset values, which in turn would tend to boost aggregate demand and so add to inflationary pressures.

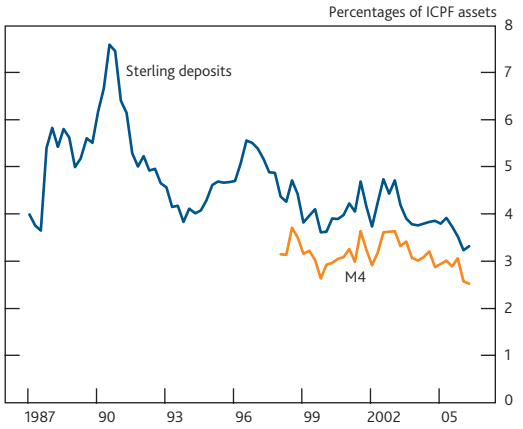
Chart 6 Broad money across industrialised countries



Source: Bank of England calculations.

Well, since 2003, institutional investor M4 has accounted for less than a fifth of the near doubling in total OFC money holdings. And the share of money in their asset portfolios has remained in a 3%–5% range (**Chart 7**). Moreover, some contacts have suggested that with pension funds and life companies making greater use of derivatives to manufacture long-duration assets, some deposits are now held to manage collateral calls or to generate a Libor-based stream of payments. Such money holdings would not be readily available to invest in financial assets.

Chart 7 Pension fund and insurance company money holdings as a share of total financial assets



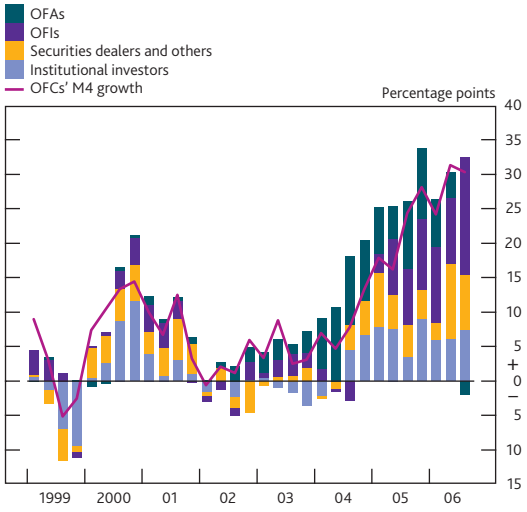
Source: Bank of England calculations.

Over the past year, the largest contributions to OFC money growth have, in fact, come from two other groups (**Chart 8**):

(1) 'Other' in the sense of not being a member of the monetary sector (commercial banks and building societies).
(2) Chrystal, K and Mizen, P (2001), 'Other financial corporations: Cinderella or ugly sister of empirical monetary economics?', *Bank of England Working Paper no. 151*.

'securities dealers and other' (8 percentage points);[1] and what the statisticians label 'Other Financial Intermediaries' (contributing a whopping 17 percentage points).

Chart 8 Contributions to OFCs' M4 year-on-year growth by subsector



Source: Bank of England calculations.

I would hazard a guess that a significant portion of the money holdings of securities dealers stems from their so-called 'matched' repo books. Although technically these entail secured deposits with banks, they are not money holdings that get spent (on assets or goods), and are matched pretty well by secured (repo) loans to other parts of the financial system.

The 'OFI' category is somewhat amorphous, including for example both private equity funds and special purpose vehicles (SPVs). Collectively, their holdings of bank deposits have been growing at an annual rate of over 40% for the past two years. It is extremely difficult to judge the macroeconomic significance of this, not least because no breakdown is available of the money holdings of different types of 'OFI'. On the one hand, it may be uninvested cash, reflecting for example the wave of fund raising by the private equity industry. That is most definitely cash to be invested in the equity market, but such fund raisings are highly publicised and conceivably may already have been discounted in equity prices via M&A speculation. As for SPVs, they are used for all sorts of purposes. Some effect transactions within banking groups, and should ideally be netted off. Some are used for securitisations, where investors obtain returns linked to the credit risk on a portfolio of assets. Regular cash-market securitisations, with a full transfer of the underlying assets, shrink bank balance sheets. But synthetic securitisations, which have become prevalent over the past couple of years, can involve increased money holdings.[2] It is not obvious that such deposits would be of macroeconomic significance over and above any effect on asset prices/risk premia stemming from the prior associated demand for (synthetic) credit.

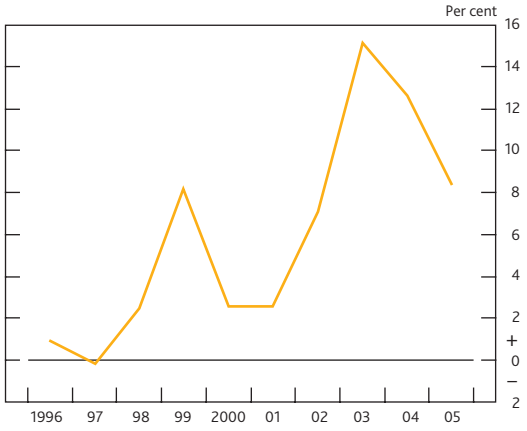
But we should pause before concluding firmly that the money data are benign. First, their counterpart, bank lending, has been growing at around 15% (although the three-month annualised rate is somewhat lower). Second, the money holdings of non-financial companies have recently been rising rapidly, perhaps signalling on upside risk to the outlook for business investment in an environment of robust profits and aggregate demand.

Third, looking at UK OFC money may be too narrow if we are trying to assess whether there is an upside risk to asset prices, and so to aggregate demand, from money growth. Given that asset prices are today determined in global capital markets, global rather than domestic money (and credit) growth may be just as relevant. On one measure, the rate of growth of 'world' broad money[3] has slowed from around 15% to around 8% since 2003 (**Chart 9**), perhaps consistent with the gradual withdrawal of monetary accommodation in the United States and elsewhere. However, the treatment of OFCs varies a lot across the G7,[4] and so their data are not strictly comparable with the UK M4 numbers. More important, so far as I can tell, most current calculations of world money growth[5] simply add up domestic money supplies, and so leave out cross-border money holdings. That might be a material omission. For example, external holdings of sterling deposits with the UK banking system have increased by more than domestic money since the late 1990s; and by around 15% over the past year. How much of this growth is attributable to non-bank financial groups, whether based in the United Kingdom or overseas, is not known.

Like much of the monetary analysis of the early 1980s, I fear that this is rather inconclusive, other than underlining that one has to get one's hands dirty in analysing the money numbers. It is plausible that a decent chunk of recent UK M4 growth should be seen in the light of structural change in the financial system. Essentially, some types of non-bank financial intermediation have become more significant, and seem to have entailed higher money holdings on the definitions currently employed. If so, recent OFC money growth does not of itself obviously have malign implications for money spending and inflation.

(1) The other intermediaries grouped with securities dealers include financial leasing companies and bank holding companies.
(2) In a synthetic securitisation, the SPV still issues 'cash' securities to its investors, but rather than investing the proceeds in the credit portfolio, it holds a high-quality liquid asset, which can be a bank deposit. It gains its credit exposure via a credit default swap. In a recent speech, R G Rajan of the IMF attributed the compression in risk premia to a shortage of assets. The growth in demand for synthetic exposures is consistent with that. Rajan, R (2006), 'Is there a global shortage of fixed assets?', remarks at the G-30 meetings in New York, December.
(3) World broad money is a weighted average of individual country M2 or closest national substitute, using market exchange rates.
(4) Included in the euro area; partly included in Japan; excluded in the United States.
(5) See box on 'Excess global liquidity, asset prices and inflation', *Inflation Report*, February 2006, page 5.

Chart 9 Annual world broad money (M2) growth (individual country M2 (or nearest equivalent)) weighted by market exchange rates



Source: Bank of England calculations.

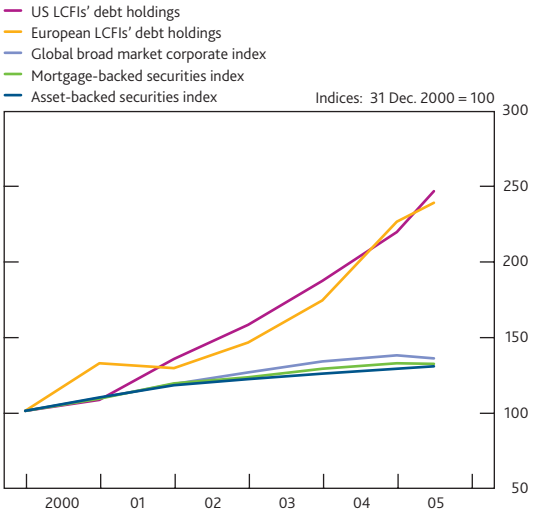
Originate and distribute: what's going on on bank balance sheets?

Much of the debate about this renewed process of disintermediation has revolved around whether the burgeoning growth of, for example, structured credit vehicles and hedge funds increases or impairs the resilience of the system. This is equivalent to asking about the significance to stability of the pronounced shift in the business model of many large banks to 'originate and distribute'. If they are not holding on to the loans and other assets they originate, one might draw the inference that bank balance sheets would have shrunk.

Nothing could be further from the truth. The balance sheets of the largest and most complex financial institutions (LCFIs) have ballooned. Both in the United States and in Europe (including the United Kingdom), their holdings of equities and of debt instruments (bonds and loans) have grown more rapidly than the underlying markets (**Chart 10**). That does not exactly look like disintermediation.

How to square this with 'originate and distribute'? Basically, in contrast to the pre-Big Bang world in the United Kingdom, today's prevailing business model entails a significant commitment of capital by investment banks. This manifests itself in a wide range of on balance sheet assets on top of the more traditional bond and equity books held as part of 'market making'. For example, bridge loans are extended to finance leveraged buyouts prior to more permanent debt instruments being placed via the capital markets. Similarly, there is an intermediate stage between origination and distribution of securitised portfolios, during which they are warehoused on banks' balance sheets. As I just described, *synthetic* securitisations, by contrast, can involve investment banks permanently holding corporate bonds and loans to hedge synthetic short positions, where the risk is transferred elsewhere. And loans against a very wide range of collateral are provided to finance hedge funds;(1) this effectively amounts to writing deeply out-of-the-money options, where the risk flows back to the financer in adverse states of the world.(2)

Chart 10 LCFIs' debts held for trading versus representative indices



Note: BNP Paribas excluded due to lack of H1 interim data.

Sources: Merrill Lynch and SEC filings, published accounts.

So investment banking does use balance sheets, but in non-traditional ways. Beyond that, there is an extra ingredient for the commercial banks. As is apparent from the money numbers, they are very much still in the deposit-gathering business. On top of maintaining their central role in the payments system, this means that, even if operating an 'originate and distribute' model in their investment banking business, commercial banks still have substantial funds to employ in asset portfolios. This can be achieved in a number of ways: for example, holding onto originated assets, buying assets after they have been securitised by other banks, or entering the principal investment business. All three are under way to a greater or lesser degree. In the United Kingdom, until quite recently large banks probably held on to more loans than their peer group.(3) In the United States and parts of Continental Europe, the commercial banking sector acquired massive portfolios of securitised assets in the first half of the decade, possibly diversifying sectoral or geographical exposures. And a range of banks have been entering or re-entering the principal investment business.

(1) Synthetic financing, via eg total return swaps, does not show on bank/dealer balance sheets beyond any net mark-to-market derivative exposure.
(2) In really adverse states of the world, collateral values would not cover all of the bank/dealer's exposure, and the net asset value of the hedge fund would have fallen too.
(3) 'Private equity: a discussion of risk and regulatory engagement', *Financial Services Authority Discussion Paper no. 06/6*, November 2006.

What to make of all this? Well it certainly underlines the difficulty of using the growth or composition of bank balance sheets as the sole basis for judging credit conditions. With so much credit distributed and traded via capital markets, quantity data have to be put alongside prices (yield spreads) and, ideally, qualitative information. It is in that context that the Bank is planning to introduce a formal survey of credit conditions next year. This important initiative is designed to help us get behind the money and credit data.

A second, rather obvious and by now familiar conclusion is that, in a narrow sense, it may have become more difficult to identify where risk resides, although we should not make too much of that as interest rate, currency and equity risk has been transferred around the financial system via derivatives for almost two decades. For me, it is more interesting that, in big picture terms, many banks have in effect concluded that they are better at, or will be better rewarded for, managing market risk — and its sister, counterparty credit risk — than managing 'buy and hold' credit risk; and that if they are going to hold illiquid assets, they should provide a higher return than bog-standard loans.

This suggests that stability relies on the liquidity of capital markets — primary as well as secondary markets — proving durable under stress. Indeed, contacts suggest that one of their main worries is that something — they don't know what — could cause primary markets to shut for a few months, leaving them holding loans and warehoused portfolios needing to be marked down over quarterly reporting dates. Another theme is reliance on secondary markets to shed complex forms of market risk, especially when it is hard to be confident about the robustness of correlation assumptions incorporated into some pricing models and risk measures. Although there is a spectrum of opinion, many take encouragement from the way the system has weathered a series of shocks in recent years, including lately the Amaranth episode. Its non-energy portfolios were liquidated smoothly; prime brokers largely released the resulting 'excess collateral' in a timely manner; and other parts of the hedge fund industry provided a pool of capital to take on the risk in the natural gas contracts. I would not want to play that down but, inevitably, some caution may be warranted too. Amaranth's ability to build up highly concentrated positions in centrally cleared markets was a reminder of some earlier lessons, dating back to the 1987 stock market crash,(1) about the detection of large trader positions. More generally, this year's *Counterparty Risk Management Group Report*, produced by a group of leading practitioners, identified a range of issues for the industry to tackle.

Macro and financial market uncertainty

As will have been apparent, the issues I have been discussing are not really separable. There are, to be clear, a lot of reasons for confidence in monetary and financial stability being sustained. Monetary regimes are much improved. Banks are generally regarded as well capitalised. Innovation has enabled risk to be dispersed more widely, including outside the banking sector. And capital markets are deeper.

Nevertheless, it is a potential concern that, looking forward, financial markets may not be pricing for — which means that investors may not be insuring themselves against — the range of uncertainties that preoccupy the official sector. Maybe the official sector is wrong. Or maybe there is an underestimation of risks in the market, perhaps associated with the widely discussed search for yield, and possibly also with overconfidence in the capacity of monetary authorities or liquid capital markets to smooth out all shocks.

This poses three questions. Whether the risks will crystallise. Whether, if they were to, any such crystallisation would be orderly or disorderly in financial markets. And whether if asset markets were disorderly, that would feed back into the financial system in ways that both seriously amplified the adjustment and created serious threats to systemic stability.

I fear that the answers are unknowable. But the task for central banks is nevertheless clear enough. Working with our partners in regulatory organisations and in other central banks, we must seek to understand today's global banking system and capital markets well enough to tell the difference, if and when called upon to do so, between a problem requiring solely a macroeconomic policy response and a more complex financial stability problem. And, most important of all, central banks must strive to maintain the medium-term credibility of monetary policy, as an essential pre-condition for the stability in which both the real and financial economy can thrive. Not pretending that the world is simpler or safer than the reality is one small part of that endeavour.

(1) See, for example, the US *Brady Report*, and the report of the Hong Kong Securities Review Committee, 1987.

The impact of the recent migration from Eastern Europe on the UK economy

In this speech,[1] Professor David Blanchflower, member of the Monetary Policy Committee, discusses the origins of the most recent influx of migrants to the United Kingdom. He also examines why the East of England has received a disproportionate number of these new workers and why employers choose to hire them. He concludes by looking at the consequences of migration on the UK economy in general, arguing that recent immigration has raised the supply potential of the economy by more than demand, and thereby acted to reduce inflationary pressures.

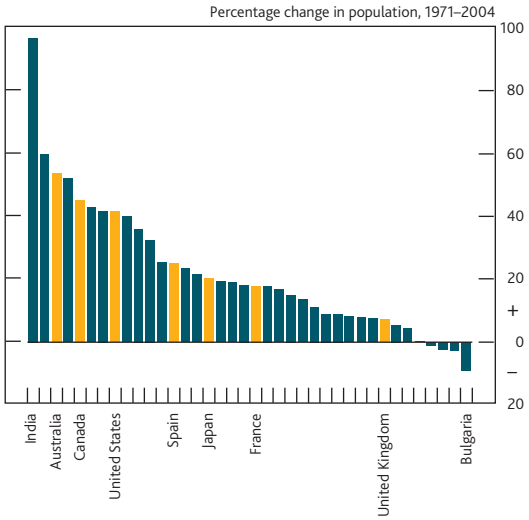
Immigration has been a growing issue for the UK economy in recent years, in more ways than one. The number of immigrants coming to the United Kingdom has risen sharply since the turn of the millennium, and the East of England appears to have been one of the most significant recipients of these migrants. And with Bulgaria and Romania having joined the EU on Monday (1 January 2007) it seems a pertinent time to be doing a speech on the subject. So I am very pleased to be here in Cambridge today to talk to you about my own feelings on the implications of migration for the UK economy, but also to learn your thoughts.

I have been thinking about issues associated with migration since joining the MPC back in April, and as background to this speech, I have published a paper this morning on the subject written jointly with two of my colleagues at the Bank, Chris Shadforth and Jumana Saleheen. The Bank has been at the forefront of thinking about immigration for some time — even hosting a conference on the subject in early 2006 — and this paper builds on what we already know, or what we think we already know! I say that because migration is very difficult to understand. What drives people to want to migrate? Who are these migrants? Why do they choose the United Kingdom? Why do they choose the East of England for that matter? How many have come? How many have returned home — perhaps to return in the future? What does it all mean for my colleagues and me on the MPC when we are setting interest rates? I hope to briefly guide you through some of these issues today, giving a flavour to some of the answers, but also asking for your help in answering a few of the outstanding questions.

Most of what I am going to talk about today reflects the national picture — since we set a national interest rate. But I am also going to talk briefly about a number of intriguing labour market developments that have occurred here in the East of England over the past twelve months.

Population growth in the United Kingdom as a whole has been remarkably low by international standards over the past 35 years (**Chart 1**). Between 1971 and 2004, the UK population grew by just 7%, less than most of the other EU countries, Australia, Canada, Japan, New Zealand and the United States. Moreover, the scale of net inward migration to the United Kingdom has been much lower than in most other EU countries until recently, and even now remains below the levels of both Italy and Spain.

Chart 1 Population growth, 1971–2004[a]



Sources: Eurostat, *Health Statistics Quarterly*, Vol. 32, Winter 2006 and *US Statistical Abstract 2006*.

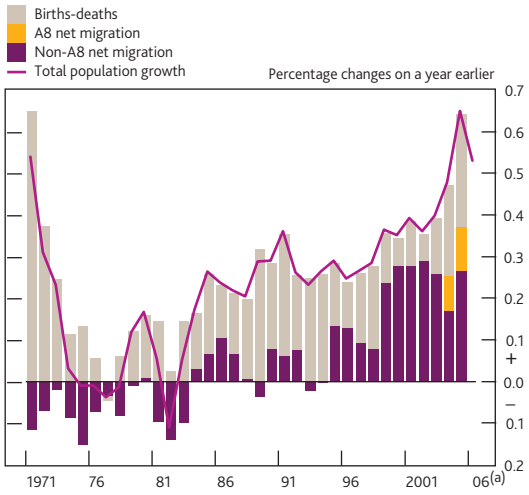
(a) The chart shows the ordering of population growth between 1971 and 2004 of the 38 countries listed in Table 2 of the full paper.

However, the UK population has grown at a faster pace since the turn of the millennium. This recent growth has been driven primarily by changes in net migration (**Chart 2**). Both the

(1) Delivered at a lunch with members of the Cambridgeshire Chambers of Commerce on 4 January 2007. The full version of this speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech297.pdf.

inflow and outflow rates have risen, but the inflow rate has risen more rapidly, with an influx of migrants from eight East European countries — known as the Accession 8, or A8 for brevity (the Czech Republic; Estonia; Hungary; Latvia; Lithuania; Poland; Slovakia; and Slovenia). As you may have gathered from press coverage, the numerical flow has been particularly large from Poland, but as a proportion of the population, the flow has been especially dramatic from Lithuania and Latvia. Approximately 1.6% of the home population of Lithuania and 1.25% for Latvia have come to the United Kingdom in the past two years according to one data source, compared with 0.8% from Poland and 0.2% from Hungary.

Chart 2 Annual UK population growth, based on official estimates of migration



(a) Official disaggregated data are not yet available for 2006.

More generally, it appears that the propensity to migrate to the United Kingdom is higher the lower is GDP per capita in each of the A8 countries. So for example, we find that countries with the lowest GDP per head, such as Lithuania at 2,500 euros, are more likely to be registered on the UK Worker Registration Scheme (WRS) than those from countries with higher GDP, such as Slovenia, at 11,400 euros. The propensity to migrate is also negatively correlated with levels of life satisfaction or happiness, and Eastern European countries are well known to have low levels of happiness.

The increase in the net migration flow actually predates the influx of A8 migrants, reflecting a steady rise in the number of immigrants to the United Kingdom from Asia and the Middle East too. It is expected that there will be a further inflow from Romania and Bulgaria who joined the EU on Monday (1 January 2006), although early press coverage suggests that the restrictions the UK Government put in place on their ability to work in this country has stymied any mass migration. Indeed, some of the coverage suggests that individuals from these countries are keener to move to Spain or Italy than the United Kingdom. It remains uncertain how many will come from these countries going forward, but it will obviously depend on which other EU countries open their borders and what job opportunities are available to them.

Only the United Kingdom, Ireland and Sweden allowed workers from the A8 complete access to their labour markets when they joined the EU in May 2004. Finland, Greece, Portugal and Spain subsequently opened their labour markets to these workers on 1 May 2006, while Italy followed in late July 2006. Five other countries (Belgium, Denmark, France, Luxembourg and the Netherlands) alleviated restrictions in 2006, and all restrictions have to be lifted within seven years of accession. As such, it is uncertain going forward whether the flows to the United Kingdom will remain as large as they have been given the other options that are now becoming available to migrants.

At the outset, it does need to be stressed, however, that the exact number of A8 migrants that has come to the United Kingdom to work thus far is to some extent uncertain. In part, this reflects the fact that there is no single database or record for nationals that have come from the A8 countries to the United Kingdom. However, there are a number of sources of information that can help us estimate how many migrants from the A8 countries might have come.

1 The **Worker Registration Scheme** (WRS). Migrants from the A8 are obliged to register on the Home Office administered WRS if they are employed in the United Kingdom for a month or more. Workers who are self-employed do not need to register and are thus not included in these figures.

2 The **International Passenger Survey** (IPS), which is a voluntary survey of individuals passing through the main UK air and sea ports and the Channel Tunnel.

3 **National Insurance Numbers** (NINo) that, as you all know, are required for employment/self-employment purposes or to claim benefits and tax credits.

4 The **Labour Force Survey** (LFS), which is a quarterly survey of individuals living at private addresses, student halls of residence and health facilities.

The number of A8 migrants entering the United Kingdom since accession appears somewhat uncertain given these four data sources as they give quite a range of estimates. But the different sources vary in their coverage, both in terms of the migrants captured — including definitional differences — and the periods of observation. Following adjustment to ensure they cover the same period, the number of NINo applications and number of WRS applicants is broadly comparable at around 500,000.

The LFS and IPS data are much lower than these, but again comparable with one another. The remaining differences between the estimates reflect the groups of individuals covered and definitions employed. The LFS and IPS data are designed to capture only those migrants who stay in the country for an extended period of time — more than six months for the LFS and twelve months for the IPS. In contrast, the NINo and WRS capture all migrants, including those that might return home relatively quickly — or in some sense commute to the United Kingdom for work.

Having reconciled the differences as far as possible, there appears to be consistent evidence from the WRS and NINo applications that approximately 500,000 workers from the A8 countries had come to work in the United Kingdom between May 2004 and late 2006. It is, however, unclear as to how many of them are working in the United Kingdom at any one time, since many of them may have only been here for short time periods before returning home — maybe as many as a half based on LFS and IPS estimates. I suspect that a number of them have been employed in seasonal work, just as is the case of many Mexicans in the United States who come to pick crops in the Central Valley of California before returning home and then returning the next picking season.

To date, the East of England appears to have received a disproportionate number of the A8 migrants arriving in this country. One source — the WRS — which records the number of employees that have come to the United Kingdom, suggests that a total of 73,035 A8 workers have arrived in the East of England since accession — or 15.0% of all A8 migrants who have come to the United Kingdom, more than any other region — London is the next with 13.1%. That compares with a population in the East of England a shade less than 10% of the United Kingdom's.

The attraction of the East of England likely reflects the industrial composition of the region, which is skewed towards those industries in which we know A8 migrants tend to specialise: agriculture, business and administration (whereby we mean temporary agency work) and construction. **Chart 3** shows the importance of these industries in the East as a proportion of gross value added. **Chart 4** shows their importance in registrations under the WRS.

It also is likely that the East of England's booming labour market has acted to attract migrants, although that picture has changed somewhat over the past twelve months or so. The labour market here has declined more rapidly over the past twelve months than nationally on a number of measures. Maybe these labour market changes have had something to do with migration? Are they a cause or an effect? The answer is unclear, but probably a little of both. Given that the data on migration at a national level are uncertain, you can imagine how difficult it is to try and

Chart 3 East of England share of UK gross value added

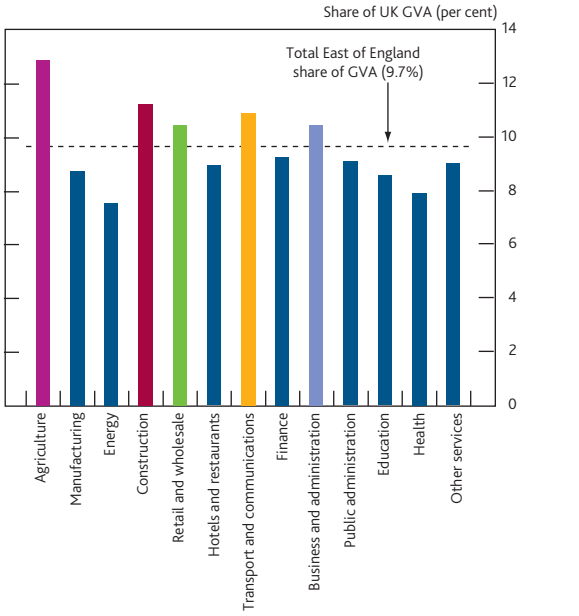
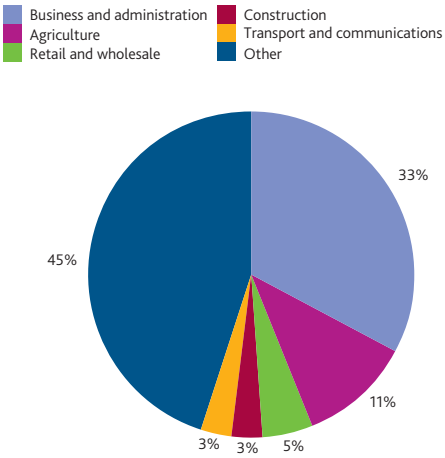


Chart 4 Distribution of total UK Worker Registration Scheme applications by industry



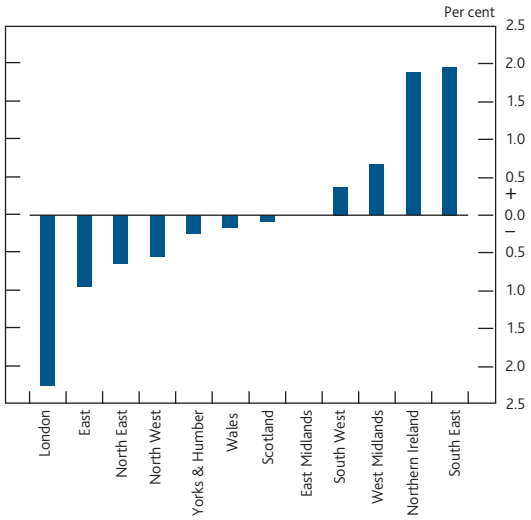
Source: *Accession Monitoring Report*, May 2004–September 2006.

disaggregate the data and tell stories at a regional level. We have had a go though!

It appears that while the total number of immigrants — including A8 immigrants — has continued to increase, the share of new immigrants settling in the East — those that have arrived in the past two years — has recently fallen. **Chart 5** shows the change in the share of new immigrants going to each region. The fact that the East is negative means that a smaller share of immigrants settled here in 2006, compared to 2005.

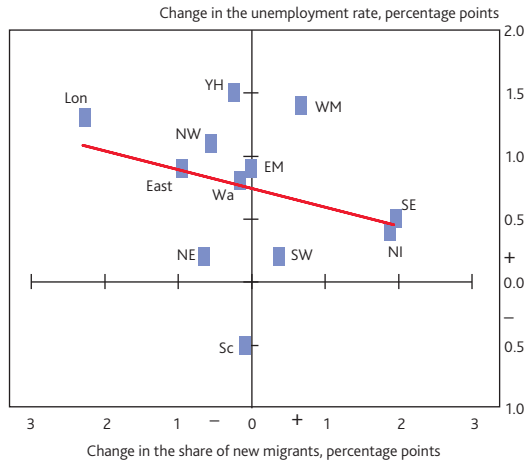
The other regions that have seen a falling share of migrants are London, the North East, the North West, Yorkshire and Humber and Wales: **Chart 6** shows that four (Y&H, NE & London) out of these six regions have also seen some of the

Chart 5 Change in the share of new immigrants going to each region (2006 less 2005)



Sources: Labour Force Survey microdata and ONS.

Chart 6 Change in regional unemployment rates and immigration (2006 less 2005)

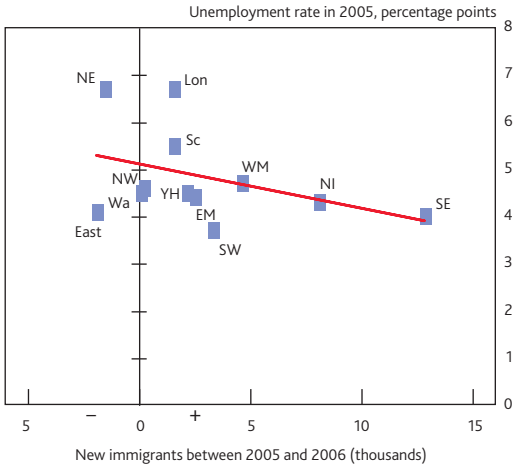


Sources: Labour Force Survey microdata and ONS.

largest increases in their unemployment rates, including the East. So **Chart 7** shows the opposite of what we might have expected; regions with the biggest increases in immigration tend to have had the lowest unemployment rates. And this is consistent with the possibility that foreign workers are attracted to those regions where the unemployment rate is the lowest and opportunities the greatest.

So, we might conclude that while the labour market in the East was booming migration to the region was high, but now other regions appear to be attracting a greater share of the new arrivals. That being said, the changing patterns of employment in the East might reflect an increased reliance on migrant labour, since A8 migrants tend to work disproportionately in temporary jobs or be self-employed. But why place a greater reliance on immigrant labour?

Chart 7 Regional unemployment rates in 2005 and the change in immigration (2006 less 2005)



Sources: Labour Force Survey microdata and ONS.

In a recent survey, some of the Bank's Agents' contacts suggested that A8 workers are more productive, more likely to show up on time and take fewer sick days than their domestic counterparts. This is consistent with the findings of a Home Office study on the use of migrant labour that concluded as follows.

'Employers cited advantages of migrant workers in terms of their general attitude and work ethic. They tended to be more motivated, reliable and committed than domestic workers. For example, migrants were said to be more likely to: demonstrate lower turnover and absenteeism; be prepared to work longer and flexible hours; be satisfied with their duties and hours of work; and work harder in terms of productivity and speed. In the view of some employers, the more favourable work ethic of migrant workers encouraged domestic workers to work harder.'

So what impact have these A8 migrants had on the UK economy? The empirical literature from around the world suggests little evidence that immigrants impact negatively on native outcomes including wages, employment and unemployment. The finding is of a small, yet significant downward effect on wages, but no impact on employment or unemployment. Work done by the Department for Work and Pensions confirms this result for the United Kingdom, suggesting that A8 migrants have had no significant impact on the claimant count. Recent work by a number of other authors for the United Kingdom is also consistent with this view.

The overall impact of immigration, including immigration from the A8 countries, on inflation and growth is on its own not clear-cut — there is no automatic rule of thumb that we can look to in order to determine the impact on the economy. This is because immigrants are both consumers and workers/producers, and so immigration affects both aggregate

demand and aggregate supply. And it is the balance between demand and supply (sometimes called the output gap) that determines inflation. So my colleagues and me on the MPC need to take a judgement about whether immigration has added more to supply or to demand in recent years. I'll briefly look at each of these in turn.

In thinking about the supply potential of the economy, most people would probably agree that extra (immigrant) workers in the economy would raise the supply potential of the economy. But the extent to which aggregate supply increases will depend on the economic characteristics of immigrants relative to native workers. Immigration of higher-skilled (or more productive) workers could temporarily raise the domestic rate of productivity growth. Furthermore, immigrant labour could lower the natural rate of unemployment — the rate of unemployment that would exist in the absence of cyclical unemployment — by filling skill gaps or by tempering wage demands, as wage bargainers become aware that they can be replaced more easily than in the past.

In support of the latter argument, the OECD *Economic Outlook* (2006) notes that 'international as well as UK evidence suggests [that] immigration can serve to make the labour market as a whole more fluid and wages less sensitive to demand fluctuations'.

In thinking about aggregate demand, most people would agree that immigrants are extra consumers and that they raise aggregate consumption demand. It is likely that immigrants spend a lower fraction of their income when compared to domestic workers because they remit part of their earnings to their home countries. If immigrants spend a lower fraction of their income in the United Kingdom — perhaps because they send remittances back home or spend less on durable goods while temporarily resident in the United Kingdom — this would, on its own, suggest that immigrants raise demand by less than they raise supply. But aggregate demand might also rise because of increased investment.

The theoretical argument here is that firms require both labour and capital to produce their output. Immigration gives them more labour, and firms may wish to supplement this with more capital. But the extent to which investment rises, and how quickly, will depend on the skills of immigrants and the technologies of firms. If firms are able to substitute between labour and capital then there may be a smaller impact on investment than might otherwise be the case.

In summary, it seems that recent A8 immigration has acted to reduce the natural rate of unemployment in the United Kingdom and raised the supply potential of the economy. But it also seems that recent immigration is likely to have raised potential supply by more than it has raised demand, and thereby has acted to reduce inflationary pressures. This argument holds for three reasons. First, the consumption behaviour of native workers may have been affected by the increased 'fear' of unemployment resulting from a more flexible labour market. Second, the recycling of remitted funds back to the United Kingdom is unlikely to be perfect. Third, firms may be able to substitute between capital and labour, offsetting some of the potential for investment spending to rise.

Going forward, and with the accession of Romania and Bulgaria, immigration is likely to remain an issue of enormous interest to both the Monetary Policy Committee and you as business leaders. I hope what I have said today was of interest, and I'm keen to learn what you think.

Inflation and the supply side of the UK economy

In his inaugural speech[1] as a member of the Monetary Policy Committee, Andrew Sentance[2] sets out his views on the principles which underpin the successful conduct of monetary policy and discusses the factors underpinning the growth of the supply-side potential of the UK economy. Since the mid-1990s, UK growth has been boosted by a shift to a lower equilibrium unemployment rate. In the absence of an alternative boost to growth from labour supply or productivity, the United Kingdom's annual GDP growth rate would fall back from the 2.8% recorded over the past decade. Immigration and rising participation in the labour force are currently helping to support the growth of potential supply — but these sources of growth may not be sustained over the medium term.

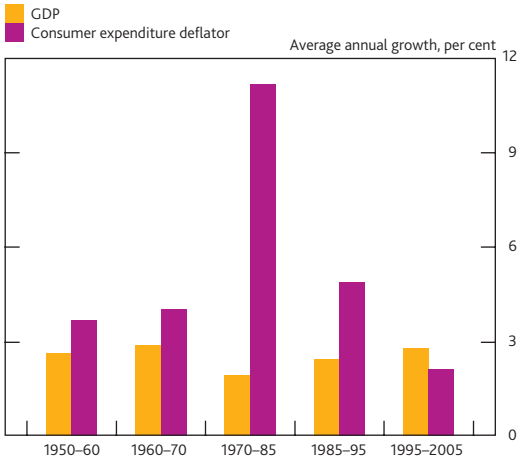
When I joined the Monetary Policy Committee (MPC) in October, I decided to give myself three months before making a major speech — to allow time to become more familiar with the Committee and the issues it faces. Well, that probationary period has now elapsed. I am now in my fourth month as a member of the MPC, and I would like to thank Bloomberg for hosting this occasion, and providing the venue and opportunity to break my self-imposed vow of silence.

At various points over the past few months, I have been asked for my thoughts on this new challenge that I have taken on. I am delighted to have joined a team with an excellent track record of success in economic management to date. While the MPC has been in charge of monetary policy, the UK economy has built on and consolidated the period of low inflation and sustained growth which began in the mid-1990s. As a result, the United Kingdom has achieved a degree of price stability and a record of economic growth not seen since the Bretton Woods era of the 1950s and the 1960s, as **Chart 1** shows.[3]

Inflation has also been kept very close to its target rate. From June 1997 to December 2003, annual RPIX inflation averaged 2.4% compared with a target level of 2.5%; and since January 2004, CPI inflation has averaged 1.9% compared with a 2.0% target.[4] When the MPC was established in 1997, you would have got very long odds on its ability to keep inflation so closely in line with the Government's target over such a long period.

On the one hand, therefore, all that is very positive. But I would not be a true economist if there was not a balancing 'on the other hand' statement! And I do approach my current responsibilities on the MPC with a certain amount of trepidation. Institutions which build up a track record of success also create expectations for the future. Economic history over the past 40 years provides many examples of how things can go wrong for those in charge of UK monetary policy.

Chart 1 Real GDP growth and inflation, 1950–2005



(1) Given at Bloomberg City Gate House on 16 January 2007. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech298.pdf.

(2) I would like to thank Andrew Holder and Ben Westwood for research assistance and invaluable advice. I am also grateful for helpful comments from Kate Barker, Charles Bean, Tim Besley, David Blanchflower, Charlotta Groth, Neal Hatch, Mervyn King, Lavan Mahadeva, Peter Rodgers and Chris Shadforth. The views expressed are my own and do not necessarily reflect those of the Bank of England or other members of the Monetary Policy Committee.

(3) CPI is not available for long-term comparisons such as those shown in **Charts 1** and **2**. The consumer expenditure deflator is used as it has a reasonably close correlation with CPI over the period when both series are available.

(4) RPIX — the retail prices index excluding mortgage interest payments — was the target measure of inflation until December 2003 when the target measure was changed to the current target measure, the consumer prices index (CPI), which is calculated in line with a methodology agreed with other European Union members.

The challenge and responsibility facing the current Committee is to avoid these pitfalls and sustain the record of the past decade into the future. We know we are likely to have to conduct monetary policy in the face of many actual and potential shocks to inflation and economic growth, particularly arising from the global economy. As today's inflation figures highlight, the current challenge is to ensure inflation returns to target after its recent pickup, associated with high energy prices and strengthening demand.

The conduct of monetary policy

Our ability to navigate successfully through these periods of turbulence hinges on having the right procedures and processes in place and on the way policy is conducted within them. While the Bank of England Act lays down the framework within which the MPC operates, and some of its processes, the conduct of monetary policy is shaped by the judgement and the decisions of the Committee itself. In my view, there are three key ingredients to the successful conduct of monetary policy — which provide a reference point in my capacity as a member of the MPC.

First, our actions and statements should reinforce expectations of low inflation, consistent with the inflation target set by the Government. Inflation expectations can be very powerful in maintaining monetary stability if they are well anchored, as they have been in recent years. They are very dangerous if they become unhinged, which is what happened in the United Kingdom between the mid-1960s and the mid-1970s. It took us two decades, three recessions, and a prolonged period of high unemployment, before expectations of low inflation were properly re-established in the mid-1990s.

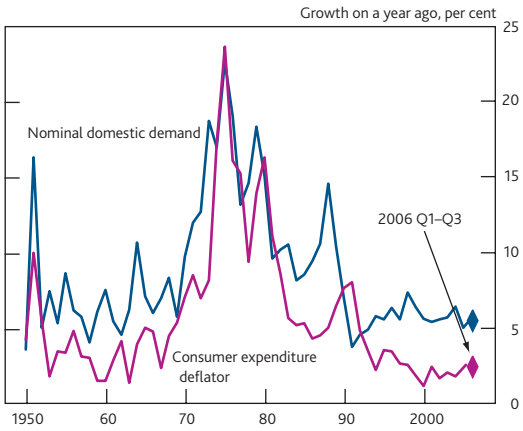
One of the benefits of the current inflation-target framework is that it sets a clear benchmark to guide expectations. But this will only be effective if the MPC also acts in a manner consistent with this benchmark — continually reinforcing its credibility.

Second, the growth of demand needs to be kept in a range consistent with supply potential and the inflation target. The key instrument available to the MPC to influence demand conditions is the short-term interest rate, though in setting rates we also need to take into account lags in the monetary transmission mechanism.

There are a wide range of indicators available to the MPC to monitor demand conditions, and we make use of business surveys and the reports from the Bank's regional Agents around the country as well as official statistics. However, a good summary indicator of demand conditions is provided by the growth of nominal domestic demand — total money spending on goods and services by UK consumers, firms and government. It is not a perfect indicator. Domestic spending growth also needs to be assessed alongside external demand pressures, from the global economy and the exchange rate, as about a fifth of the expenditure on UK goods and services comes from overseas.(1) Domestic demand is also based on National Accounts data which can be subject to some measurement error.

Chart 2 shows the association between low and steady nominal domestic demand growth and the period of low inflation since the mid-1990s. The previous sustained period of low inflation — in the 1950s and 1960s — was also a period of relatively low nominal domestic demand growth — though not as stable then as recently. By contrast, the 1970s and the late 1980s, when the inflation genie escaped from the bottle, saw high and volatile increases in money domestic demand.

Chart 2 Nominal domestic demand growth and inflation, 1950–present



Over the past year, domestic demand has picked up following a period of relative weakness in 2005, and this has been accompanied by strong growth in the world economy. The need to keep the growth of demand in check — and hence restrain wage and price increases — has been an important factor in recent interest rate decisions by the MPC.

The third element which is important for the conduct of monetary policy is a good understanding of how the performance of the supply side of the economy is evolving and how it is being affected by external factors — such as globalisation, or the major change in energy prices we have seen recently.

In simple terms, inflation is sometimes described as 'too much money chasing too few goods'. In addition to understanding demand conditions — ie whether there is too much money — we also need to understand the factors affecting the

(1) The percentage is higher in tradable sectors such as manufacturing, but the average for the UK economy as a whole (exports as a percentage of total final expenditure) is 22% in the year ending 2006 Q3.

production of goods and services, and how changes in these supply factors are affecting the outlook for economic growth and inflation.

Medium-term growth potential

There are a number of aspects of the supply-side performance of the economy which are of particular interest to monetary policy makers. One of the key issues is the growth of the output potential of the economy, against which we need to assess whether the rate of increase in demand remains compatible with low inflation. This is an important benchmark for policy-setting, though the relationship between demand and inflation is much more complex than a simple 'output gap' model would suggest.

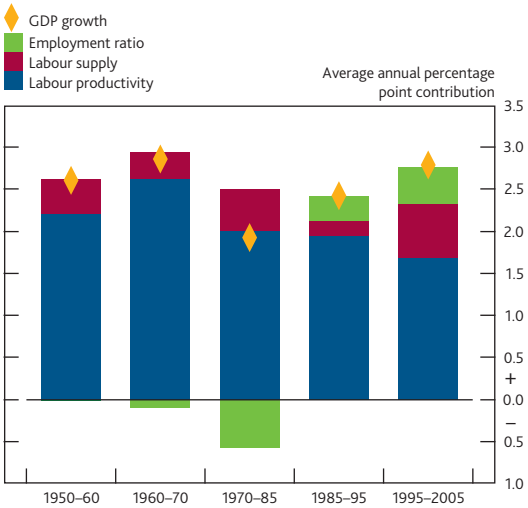
The supply-side potential of the economy will tend to increase over the medium term for two main reasons. First, employment is able to increase as the labour force expands. Second, the workforce becomes more productive over time, as the result of a combination of technical progress and investment in human and physical capital. In the United Kingdom and most other major economies, increased labour productivity has been the dominant force underpinning economic growth over the medium term.

However, the proportion of the labour force which can be productively employed may also change over time. We have seen significant shifts in the unemployment rate in the United Kingdom and many other economies in the past few decades. While short-term variations in unemployment can be viewed as cyclical, since the 1960s there have clearly also been major structural shifts in the equilibrium unemployment rate consistent with low or stable inflation — normally described as the 'natural rate' of unemployment or the NAIRU.(1)

Though we cannot measure it exactly, between the late 1960s and the mid-1980s, the economy's equilibrium rate of unemployment appeared to increase — due to the interaction of the shocks hitting the economy over that period and relatively inflexible labour market structures and behaviour. Since the 1980s, changes in industrial relations, greater labour market flexibility and the development of more pro-active government labour market interventions have helped to reverse this trend.(2)

Chart 3 presents a simple breakdown of UK economic growth in previous decades into these three factors: labour productivity, measured in terms of output per person employed; labour supply growth — reflecting population growth and increased labour force participation; and changes in the employment ratio — the mirror image of the unemployment rate.(3) The periods used aim to reflect the likely underlying growth trend, by taking mid-cycle years for the start and finish dates of the periods used for analysis, and also avoiding years of high inflation.

Chart 3 Contributions to GDP growth, 1950–2005



Note: Labour productivity defined as real output per worker. See Annex for details of calculations.

Sources: Feinstein (1972) and ONS.

Contributions to growth since the mid-1990s

The past decade is of particular interest, for a number of reasons. It mainly reflects the period during which the MPC was steering monetary policy and is also the most obvious benchmark when we look forward to the years ahead. It is also the strongest sustained period of GDP growth since the 1960s, which reflects the particularly strong contribution of the labour market factors — higher employment and increased labour supply — to economic activity over this period.

This strong growth may have come as a surprise to some people, but not to me. When I was heading the Centre for Economic Forecasting at the London Business School (LBS) in the mid-1990s, I published a forward-looking assessment of growth prospects for the decade ahead in the LBS Economic Outlook.(4) My conclusion then was:

> '…the UK economy has the potential to exceed the performance of the last decade. Though productivity growth is not expected to be spectacular, the analysis of recent labour market developments suggests that we should be able to run the economy with a much lower level of

(1) Non-accelerating inflation rate of unemployment. See Layard, Nickell and Jackman (1994) for an analysis of changes in the NAIRU in the United Kingdom and other economies.
(2) Nickell (2001) provides an analysis of changes in the equilibrium rate of unemployment since the 1960s, consistent with the views in this speech.
(3) The employment ratio is defined for this paper as unity (100%) minus the unemployment rate. See Annex for further explanation of this analysis and data sources.
(4) Sentance (1995).

unemployment over the medium term. If, in addition, more optimistic projections of productivity growth turn out to be correct, the UK economy has the prospect of a new 'golden age' of growth, matching the average performance of the 1950s and 1960s'.

Table A 1995–2005 performance in context

Average annual growth (per cent)

	1960–95	1995–2005 latest estimate	*1994–2004 (projected)*
GDP	**2.3**	**2.8**	***2.4–2.9***
of which, (percentage point contribution)			
Population of working age	0.3	0.5	*0.3*
Participation rate	0.0	0.1	*0.2*
Employment ratio	-0.2	0.4	*0.3–0.5*
Labour productivity	2.2	1.7	*1.5–2.0*

Note: Labour productivity defined as real output per worker.

Sources: Feinstein (1972), ONS and Sentance (1995).

Table A shows a table comparing my projections from that article in November 1995 to the actual performance of the economy over the period 1995–2005, and the performance over the preceding three and a half decades. The growth of GDP in the UK economy over this period was close to the top of the 2.4%–2.9% range I predicted, averaging 2.8% per annum.(1) It was also half a percentage point stronger growth than the average growth over the previous three and a half decades might have suggested.

This positive outcome did not reflect particularly strong productivity growth. Over the past decade, output per worker in the United Kingdom increased by an average of 1.7% per annum — in the middle of the 1.5%–2.0% range I had suggested in my 1995 article.(2) Rather, this pickup in growth reflected a much bigger contribution to growth from employment than previous decades.

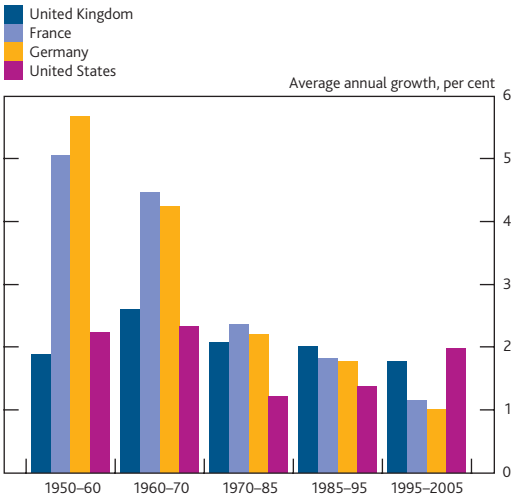
The middle three rows on this table show the various components which make up the employment contribution to economic growth — changes in the population of working age, labour force participation and the unemployment rate. Combined, these factors contributed around 1% per annum to GDP growth between 1995 and 2005, close to 40% of the increase in GDP over that decade. Compared with earlier decades, labour supply factors provided a slightly stronger boost to growth potential, but the most significant factor was the sustained fall in the unemployment rate.

The central thesis in my 1995 article, that employment would make a much stronger contribution to economic growth than in previous decades, therefore turned out to be correct. But while you might find it reassuring that my credibility as a forecaster remains intact, the more significant point for monetary policy is how the various components which contribute to medium-term growth potential are likely to perform in the years ahead.

Labour productivity growth

Labour productivity is the most important of these components. As Paul Krugman has commented: 'Productivity isn't everything but in the long run it is almost everything. A country's ability to improve its standard of living depends on its ability to raise its output per worker'.(3) The main factors influencing labour productivity are the accumulation of physical and human capital and the process of innovation and technical progress.

Chart 4 International average labour productivity growth comparisons, 1950–2005



Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database.

Chart 4 compares the UK labour productivity growth experience with a peer group of countries across the post-war period. Until the 1970s, the prevailing story was that UK productivity growth was disappointing relative to other countries. In the 1970s and early 1980s, the United Kingdom moved up into the middle of the productivity growth league, mainly because our rate of increase held up better in the context of a broader productivity slowdown.

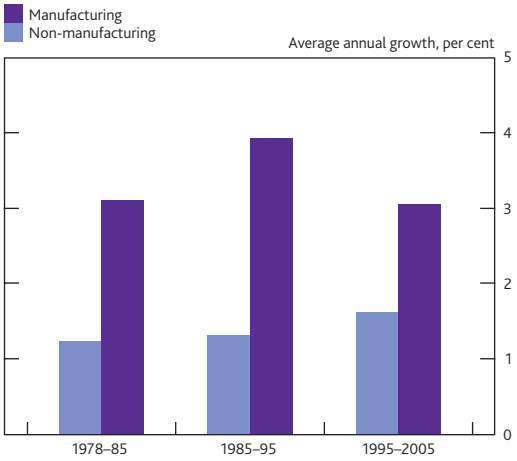
Since the mid-1980s, the United Kingdom has been a leading performer on labour productivity growth relative to our peer group. Averaged across the two decades since the mid-1980s, measured in terms of output per worker, the United Kingdom has had a stronger productivity growth rate than the United States and the other leading European economies.

(1) Sentance (1995) uses 1994–2004 as the forecast period, compared with 1995–2005 shown here, consistent with other data in this speech. However, this makes virtually no difference to the comparisons shown.
(2) A reduction in hours worked per employee acted as a slight drag on the labour productivity growth rate over the decade 1995–2005; measured in terms of output per hour worked, productivity growth has been roughly stable at about 2% per annum over the past two decades.
(3) Krugman (1997).

In the past decade, however, we have been pipped to the post in the productivity growth league by a strong pickup in the United States — widely attributed to the boost from heavy investment in information technology in the 1990s. In 1987, Robert Solow famously quipped: 'You can see the computer age everywhere but in the productivity statistics'.(1) Now — at last — it may be showing up, with annual productivity growth in the United States picking up to about 2% over the past decade, compared with 1.4% in the ten years before that and 1.2% in the 1970s and early 1980s.

Could something similar happen in the United Kingdom? Research carried out at the Bank of England shows that investment in ICT (information and communications technology) is already a significant contributor to productivity growth, accounting for nearly half of market sector productivity increases in the late 1990s.(2) So perhaps we should be wary about expecting a further boost to productivity from this direction. In addition, we need to recognise offsetting influences to any further boost information technology might provide.

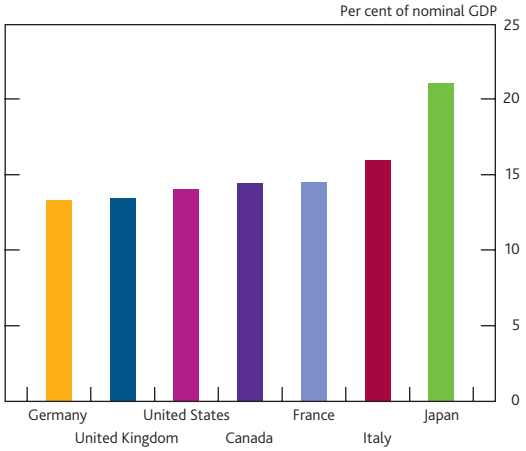
Chart 5 Labour productivity trends since 1978



Note: Productivity defined as real output per job.

First, the composition of output and employment is shifting away from manufacturing towards services. With manufacturing employment now down to about 11% of total employment, non-manufacturing sectors — mainly services — will dominate the prospects for productivity going forward. As **Chart 5** shows, this is a shift away from a sector which has historically delivered stronger productivity growth towards activities with a weaker productivity track record — though there is also considerable variation in productivity performance within the services sector. (For example, transport and distribution and business and financial services have experienced reasonably strong productivity growth, while public services and sectors providing personal services tend to be below average.) **Chart 5** also shows an improvement in non-manufacturing productivity in recent years, though the drag exerted by output and employment shifting from manufacturing to services has offset the benefit to whole-economy output per head from this improving trend.(3)

Chart 6 Non-housing investment in the G7, average 1995–2005



Note: 1995–2004 average for Canada, Japan and the United States.

Source: OECD.

Second, the United Kingdom has a modest record of investment in physical and human capital compared to other G7 countries, as **Chart 6** shows in respect of fixed capital investment. Business investment was relatively weak in the first half of this decade and, while it is now picking up, the contribution of capital input to growth is likely to be relatively modest in the years ahead. There are also concerns about the rate at which we are investing in human capital too. For example, the recent *Leitch Report* published by the Treasury argued that the United Kingdom's skills base was 'mediocre' by international standards, and pointed to the fact that the United States and South Korea were investing in higher education at about two and a half times the rate of the United Kingdom.(4) The contribution of physical and human capital may not therefore be as supportive of productivity growth as in some competitor countries.

In my November 1995 article, I concluded that UK trend productivity growth, measured in output per person employed, was likely to be in the range 1.5%–2.0%. In the event it has been around the middle of that range. Looking ahead, it would seem reasonable to expect labour productivity growth to continue at a similar rate. So if the UK economy is to sustain its trend GDP growth rate from the previous decade, a

(1) Solow (1987).
(2) Oulton and Srinivasan (2005).
(3) Historically, this drag has also reflected the shift in resources away from manufacturing where productivity levels are higher than services. However, looking forward this 'batting average' effect will be less significant due to the small percentage of employment now accounted for by manufacturing industry.
(4) See Leitch (2006). The United Kingdom was placed 17th in a league table of 30 OECD countries on low skills and 20th on intermediate skills. The United Kingdom invests 1.1% of GDP in higher education, compared to 2.9% in the United States and 2.6% in South Korea.

continued strong contribution is needed from employment growth as well as productivity.

Unemployment performance

In most decades, normal labour supply growth and rising participation have added around 0.3%–0.4% a year to the economy's growth rate. However, in the past decade, this has been augmented by a similar addition to growth from a sustained fall in the unemployment rate. In the mid-1990s, the unemployment rate averaged 8.7%,(1) according to the Labour Force Survey. A decade later the corresponding figure for the past three years is 5.0%. The fall in unemployment has boosted growth by around 0.4% a year, in line with my 1995 predictions.

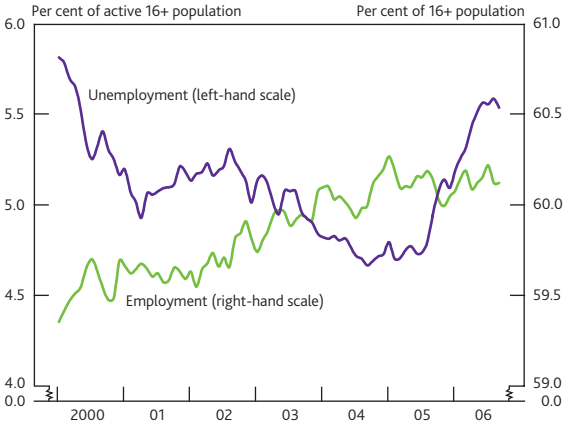
Looking ahead, however, we cannot expect a fall in unemployment of this sort to be repeated. To a large extent, this drop in the jobless total represented an unwinding of the rise in equilibrium unemployment that took place in the late 1970s and early 1980s. It does not seem realistic to return to the levels of unemployment seen in the 1950s and 1960s, which were an exceptional product of the post-war economic boom in Europe. As I argued in 1995, an unemployment rate in the range 4%–6% of the labour force seems to be sustainable and consistent with low inflation, as long as we have sensible demand management and labour market policies which promote flexibility.(2)

There is also the possibility that some labour market developments may be working to push up the equilibrium rate of unemployment, and therefore limiting future employment growth potential. In particular, the past decade has seen an extension of various forms of labour market regulation and the National Minimum Wage has been increased by 45% since 2001, more than four times the increase in the consumer prices index over the same period and more than double the rate of growth of average earnings.(3) This could have a negative impact on employment prospects and add to wage pressures in some sectors of the economy, exerting some upward pressure on the level of structural unemployment.

Another cause for concern about the outlook for unemployment is the recent behaviour of the jobless total. As **Chart 7** shows, unemployment has risen, despite employment growth of close to 1% over the past year. The employment rate recorded by the Labour Force Survey has been broadly stable, suggesting that job growth has kept pace with the rate of increase in the population of working age.

This rise in unemployment has levelled out in recent months, but it remains something of a puzzle. One possible explanation is the supply shocks that the labour market has had to absorb from migration and increased participation of older workers — though this explanation has been challenged by some observers.(4)

Chart 7 UK employment and unemployment since 2000



Sources: Labour Force Survey and ONS.

However, unlike a decade ago, the current evidence suggests we are unlikely to get a further significant boost to growth from a sustained fall in the equilibrium rate of unemployment. If medium-term growth is to exceed the rate of growth of labour productivity by a similar margin to the past decade, this will require a much stronger contribution from a rising labour supply.

Labour supply and participation

Historically, population in the 16+ age bracket has increased in the United Kingdom by around 0.3% per annum. So if we were relying purely on natural population growth as a source of labour supply increases, this would imply a slowdown in the medium-term trend rate of output growth to not much more than 2%.

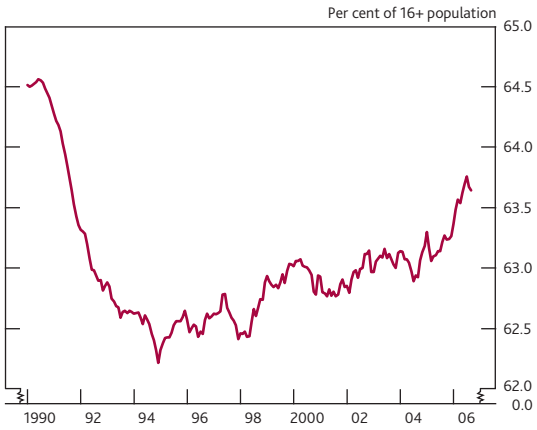
However, there are two factors which might potentially sustain growth at a much higher rate, in the same way that growth over the past decade was sustained by falling unemployment. The first is higher labour force participation, as people who were previously unavailable for or not seeking work re-enter the workforce.

As **Chart 8** shows, labour force participation — particularly in older age ranges — has been rising after a sharp fall in the early

(1) 1994–96 average, and 2004–06 average for comparison, using Labour Force Survey data.
(2) Nickell (2001) estimated that the equilibrium unemployment rate was 5.7%.
(3) The National Minimum Wage was raised to £5.35 an hour in October 2006, compared with a rate of £3.70 prior to October 2001 (increased from £3.60 in October 2000). Over the same period, the consumer prices index rose by around 10% and the average earnings index increased by 21%.
(4) Blanchflower, Saleheen and Shadforth (2007) discuss some of the evidence, particularly using regional unemployment data. Their conclusion is that the evidence points away from the hypothesis that labour supply shocks from migration or rising participation can account for the recent rise in unemployment.

1990s. Changes in the benefit system, uncertainty about future pension provision, and new age discrimination legislation are likely to reinforce this trend, and we have seen some pickup in the past couple of years.

Chart 8 Labour force participation



Sources: Labour Force Survey and ONS.

However, it will take quite a significant and sustained increase in labour force participation to make an impact on the medium-term growth potential of the UK economy. The rising trend shown in **Chart 8** was associated with an addition to employment growth of around 0.1% per annum between the mid-1990s and the mid-2000s. The recent experience points to a stronger contribution — around 0.2%–0.3% per annum, but it is not at all clear that this can be sustained over the medium term.

The other potential source of extra labour supply is migration. According to official estimates, net migration into the United Kingdom has risen fourfold since the mid-1990s, from around 50,000 a year to around 200,000 a year in 2004 and 2005. These figures have been boosted in particular by higher migration from the eight new members which joined the European Union in 2004, though the official figures suggest higher net migration goes back to the late 1990s. If sustained, this pattern of migration could contribute an addition of up to half a percentage point per annum to the growth of labour supply and hence employment.(1)

However, there is a great deal of uncertainty about the potential for a future boost to labour supply from migration. One suggestion is that migration is being significantly underrecorded and the boost to labour supply could be even bigger than I am suggesting — both now and in the future. On the other hand, the recent surge in migration associated with the accession of new members to the European Union may ease off over the years ahead. Though the accession process is continuing, with Romania and Bulgaria joining this year, more EU countries are now opening their borders to migrant workers — providing alternative employment opportunities. Also, the United Kingdom is now taking a more cautious policy stance towards migrants from the latest entrant countries.

Outlook for potential growth

So to recap the arguments I have made. The United Kingdom's medium-term potential growth can be decomposed into the likely rate of productivity growth and the potential for employment to increase without placing an inflationary strain on the economy. Over the past decade, there was a one-off boost to employment growth from a fall in the equilibrium unemployment rate. Rising labour force participation also made a modest contribution to employment growth.

These trends resulted in an exceptional period in the United Kingdom's post-war economic history when employment made a much bigger contribution to economic potential than previous decades. Whether this can be sustained into the next decade is a major source of uncertainty around the medium-term outlook. In the absence of an alternative source of labour supply increase, or an acceleration in productivity growth, there would be a fall in the United Kingdom's average GDP growth rate from the 2.8% recorded over the past decade to something closer to 2%.

Recently, migration and rising labour force participation have indeed been supporting the growth of the labour supply and boosting potential output. However, there is a lot of uncertainty around the continuation of both these trends — and hence around the medium-term growth rate of potential supply.

Monetary policy issues

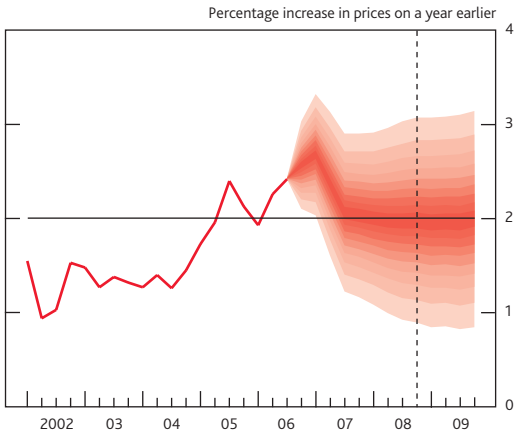
As I come to relate this analysis to current monetary policy issues, I am conscious that the minutes of our latest interest rate decision are not available — and it is not my intention today to pre-empt them. The November *Inflation Report* made clear that uncertainty about supply-side issues was contributing to the risks to the inflation outlook, and I hope I have been able to shed some light on those issues today.

The background to recent interest rate decisions has been the rise in CPI and other measures of inflation, and you will have seen the latest news today — with the December CPI inflation rate significantly above its target level. At face value, this news on inflation points to a stronger short-term surge in inflation than our central forecast in November, shown in **Chart 9**. It has also taken us very close to the level of inflation

(1) According to Saleheen and Shadforth (2006), about 70% of migrants in the 15–64 age bracket are economically active. Applying this percentage to the 200,000 net migration each year represents an increase of just under 0.5% on a total labour force (employment plus unemployed) of just over 30 million. This will be an overestimate to the extent that migration includes people outside the 15–64 age bracket, and an underestimate to the extent that migration is undercounted.

at which a letter from the Governor to the Chancellor is triggered under the current policy framework — though in 1997 most economic commentators would have been amazed if they could have foreseen that we would be approaching the tenth anniversary of the MPC and such a letter has yet to be written!

Chart 9 The November 2006 inflation projection



Source: Bank of England *Inflation Report*, November 2006.

If inflation is to be brought back to target and remain there, demand needs to appropriately restrained and expectations of inflation by wage and price-setters must remain consistent with the 2% CPI target. As the press release accompanying last week's interest rate move made clear, the MPC judged a further interest rate rise was needed to ensure that these conditions would be met and keep inflation on track to meet the target over the medium term.

Next month, the Committee will be revising its inflation forecast in the light of all the available information and issuing an updated *Inflation Report*, as usual. The *Inflation Report* is a key element in the framework for UK monetary policy and an important tool for communication from the MPC. However, some people appear to have concluded that the Committee would only adjust interest rates in months when an *Inflation Report* is published. In my view, we should not be constrained in this way. The monthly meeting cycle provides the MPC with an opportunity to review monetary policy twelve times a year and adjust interest rates in the light of our judgement on all the available information, as we have done this month.

At the start of this talk, I referred to three key ingredients to successful monetary policy in practice — reinforcing expectations of low inflation; keeping a check on demand conditions; and understanding the impact of supply changes and external factors. It is the supply side which I have discussed in most detail today, but the other elements are no less important.

In my short time as a member of the MPC, the need to reinforce expectations of low and stable inflation and to keep demand conditions in check have both pointed to the need to raise interest rates. As a Committee, we will continue to monitor economic conditions at our monthly meetings to ensure we remain on track to meet the 2% CPI target over the medium term.

Annex
Growth accounting calculations

Chart 3 is constructed using the accounting identity:

GDP ≡ Output per worker * Employment ratio * Labour supply

Where:

Employment ratio ≡ Employment/Labour supply ≡ (1 – unemployment rate)

Labour supply ≡ Employment + Unemployment ≡ Total economically active persons over 16

In **Table A**, the following identity is used to decompose labour supply further into population growth and labour participation.

Participation rate ≡ Labour supply/Population aged 16+

Contributions to GDP growth shown in **Chart 3** are equivalent to the average annual growth rates of these components over the time periods shown. These average annual growth figures are geometric means calculated using annual data. So for example:

Average annual GDP growth 1950–60 = $((GDP_{1960}/GDP_{1950})^{1/10} - 1) * 100$

The calculations use real gross value added at basic prices. Population and labour market data are mid-year estimates.

A similar accounting framework was used in Sentance (1995), which provides a more detailed discussion of this approach.

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Inflation and the service sector

In this speech,[1] Professor Tim Besley,[2] member of the Monetary Policy Committee (MPC), discusses the United Kingdom's long-term structural shift from manufacturing towards services; whether this shift is consistent with increasing prosperity and growth for the UK economy; and the implications for monetary policy. The first key theme of the speech is that what matters is not whether output is in the form of services or manufacturing — it is the move towards the production of higher value added activities that enables the UK economy to progress. Second, the speech notes that over the past ten years we have observed a tendency for consumer services price inflation to run ahead of consumer goods price inflation — therefore we might reasonably expect inflationary pressure at the current time to be coming more from the services sector, in part driven by limited spare capacity. However, changes in overall inflation depend on the balance of demand and supply factors in the economy as a whole, and hence Tim concludes that the structural shift from the production of goods to that of services does not bring about an inflationary bias.

Introduction

Ladies and Gentlemen, it is a great pleasure to be here in Cardiff where, it seems, you have had your fair share of MPC speeches of late. But I am certain that this is a reflection of Welsh hospitality. It is also a measure of the importance that MPC members attach to making their presence felt outside London and I am here primarily to gain a better understanding of what is happening to the Welsh economy.

The MPC sets the Bank Rate for the whole of the United Kingdom. But we are only too aware that the economic picture varies by sector and region. Our job on the MPC is to aggregate a wide range of information when we form our judgement about the best course of action for the United Kingdom as a whole to achieve the inflation target of 2% CPI inflation set for us by the Chancellor of the Exchequer. The role of monetary policy is to achieve price stability by balancing aggregate demand and potential supply in the UK economy.

My speech today is about one specific aspect of the supply side of the UK economy and its implications for growth and inflation. It is a long-term pattern (of more than 50 years standing) and one that you I am sure are all too aware of here in Wales — the structural shift of the UK economy from manufacturing towards services. In Wales, you have seen the share of market services in gross valued added — that is services taking out government services — rise from 39% in 1996 to 48% in 2003.[3]

Below, I will discuss some implications of this for decisions about interest rates. However, along the way, I will take the opportunity to comment on some broader issues that arise from this structural shift that has taken place over a lengthy period.

While I will take a longer-term perspective, the issue of the short-term relative strength of manufacturing and services is a subject of on-going debate. The recovery in the economies of the euro zone since the beginning of 2006 helped to provide an export-led boost to UK manufacturing after a prolonged period of contraction especially evident in 2005 when, according to the official data, manufacturing failed to grow in all four quarters. However, data for the very end of last year, for example from the CIPS/RBS manufacturing and services surveys, suggested rather less evidence of a rebalancing of the economy between services and manufacturing with the service sector once again stealing the limelight.

(1) Given at the Cardiff Breakfast Club on 18 January 2007. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech299.pdf.

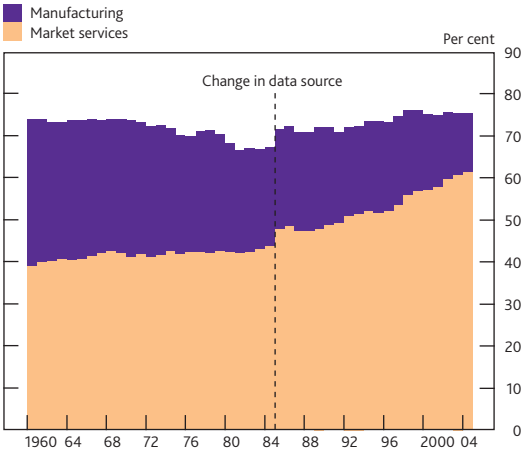
(2) I am extremely grateful to Nicola Dufty, Lavan Mahadeva and Alex Muscatelli for invaluable help in preparing this speech. I am also grateful to Mark Allan, Kate Barker, Charlie Bean, David Blanchflower, Martin Brooke, Steve Drew, Rob Elder, Colin Ellis, John Gieve, Charlotta Groth, Andrew Holder, Mervyn King, Robin Lynch, Chris Peacock, Andrew Sentance and Sally Srinivasan for their thoughtful comments.

(3) The data from 2003 are provisional ONS data published in *Regional Trends 39*. Market services nominal GVA are calculated as the sum of GVA at current prices for wholesale and retail trades (including motor trades); hotels and restaurants; transport, storage and communication; financial intermediation; real estate, renting and business activities; and other services. The excluded sectors, for example education and health, have some market activity in them.

Structural change in the UK economy

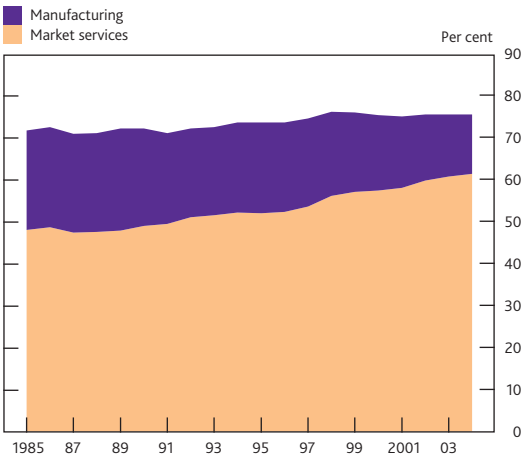
Chart 1 illustrates the familiar story. It shows the manufacturing and services share of UK gross value added at factor cost between 1960 and 2004. **Chart 2** shows the same thing between 1985 and 2004 where the data are measured on a fully consistent basis. Both show an increase in market services, ie services excluding government. This increase is from a little less than 50% of gross value added in 1985 to more than 60% in 2004. Most of this is a relocation of economic activity from manufacturing to services. It is broadly reflected in the share of employment in the UK economy which is now about 11% in manufacturing.

Chart 1 Market services nominal share of total GVA at factor cost (1960–2004)



Sources: Pre-1985 as in Malley, Muscatelli and Woitek (2003), post-1985 ONS.

Chart 2 Market services nominal share of total GVA at factor cost (1985–2004)



But market services are a heterogeneous group of economic activities including goods produced and consumed as services (such as restaurants), those that facilitate the production and consumption of other goods (such as retailing) and those that are inputs into other kinds of production (like financial services). **Chart 3** decomposes services output into four main sectors: distribution, hotels and catering; business and financial services; transport and communication and other market services. It is clear from this that the increase in business and financial services accounts for the lion's share of the growth. **Chart 4** shows this more clearly still when we look at contributions to the growth of real value added across the UK economy. It shows how business and financial services have been important to growth in output in the United Kingdom from the 1990s onwards.(1) The growth of

Chart 3 Share of nominal GVA at factor cost (1985–2004)

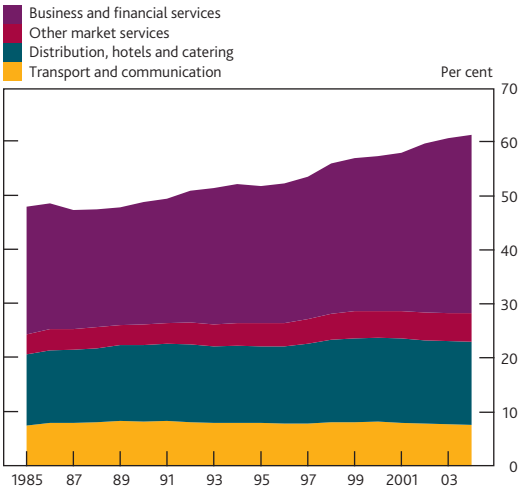
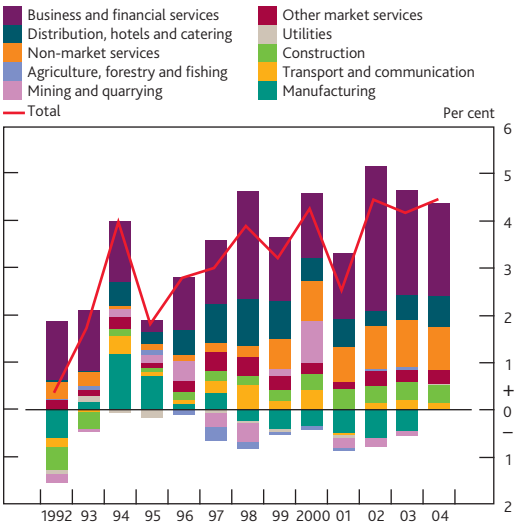


Chart 4 Real GVA income, contributions to annual growth



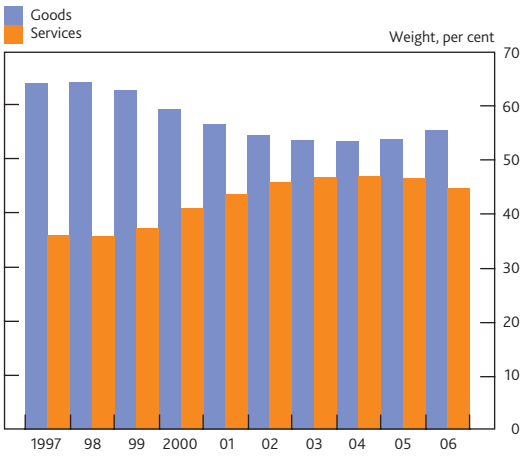
Note: See footnote (1) below.

(1) This real income measure is nominal GDP value added deflated by the consumption deflator. The total of contributions across sectors does not include the financial services adjustment (FSA). This would differ from aggregate real GDP even without the financial services adjustment whenever the GDP deflator diverges from the consumption deflator. But the two are different concepts. A real GDP value added measure aims to capture the contribution to output growth of the value added inputs in each sector only. The real income measure captures the contribution of each sector to the growth in UK real income generated. A broader measure of real income would include net income earned abroad. See Cassing (1996), Diewert (2005) and Duguay (2006) for an explanation of the real income measure. See Tily and Jenkinson (2006) for an explanation of the FSA.

outsourcing may be an important explanation of this trend, explaining why the combined share of gross value added from business services and manufacturing together has been roughly constant in the United Kingdom since 1980.

These facts are important in thinking through how structural changes affect growth and inflation in the UK economy. Business and financial services are an important intermediate input into other economic activities in the United Kingdom and are not just consumed directly. The share of the sector's gross output which is an intermediate is about 60%. That said, this sector accounts for 20% of household final demand, although a single item — imputed and actual housing rents — accounts for 70% of this. Overall, services have become more important in consumption in the United Kingdom — though they are still a less important component in CPI than are goods (**Chart 5**).

Chart 5 Weights of goods and services in the CPI basket

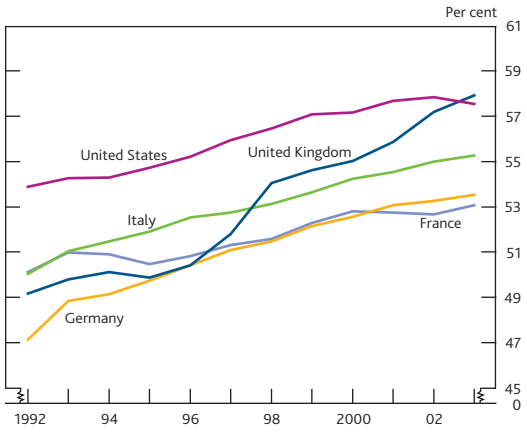


Note: CPI excludes the imputed user cost of housing.

It is useful to set this in an international context. **Chart 6** shows that the trend in the United Kingdom, while similar to other advanced economies, is more pronounced. The increase in the share of market services in the United Kingdom has been greater than that in France, Germany, Italy and the United States and its share of market services is now larger than in all of these countries. Thus, although other advanced economies have also experienced the trend towards services, this has been greater in the United Kingdom. Moreover, this is in the context of ten years or more of economic stability and growth for the UK economy.

In looking at data of this kind, it is important to acknowledge a degree of arbitrariness in whether businesses are classified as producing goods or services. A manufacturing firm that outsources its production abroad while retaining marketing, design and distribution in the United Kingdom could easily be regarded as a service sector firm even though its final output is a good.

Chart 6 Market services share of total nominal GVA (1992–2003)



Note: The OECD measure of UK market services GVA, though internationally comparable, may be based on earlier vintages of National Accounts data than that used in **Chart 2**.

Source: OECD.

Services and economic prosperity

The trend documented above is often referred to as 'deindustrialisation'. When I was first a student of economics in the early 1980s, there was much discussion of this as an economic problem. It was often said that the UK economy had 'too few producers'. Moreover, it was taken to be a symptom of long-run economic decline relative to other advanced economies. There were even those who thought that an explicit policy of protecting manufacturing jobs was needed to safeguard the standing of the UK economy in the face of global competition.

Our understanding of the process of structural change and the sources of growth has since moved on. This somewhat alarmist view of deindustrialisation and its implications was based on three myths about the service sector:

Myth 1: The *level* of productivity in the service sector is inevitably low compared to manufacturing.

Myth 2: The service sector does not benefit from productivity *improvements*.

Myth 3: Moving towards the production of services must worsen the United Kingdom's net trade position.

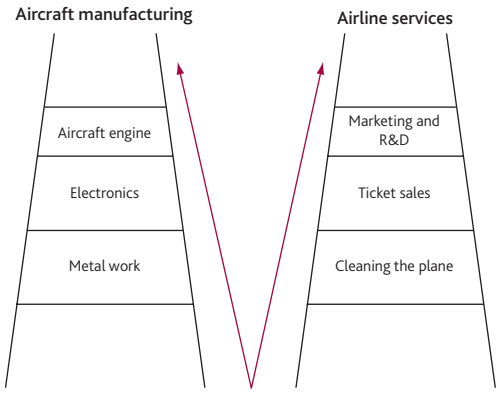
I will discuss each of these views in detail below and I will explain why I regard each of them to be a myth. But it will help if I set the scene. For this I require a brief digression on the general issue of what drives economic prosperity in a modern global economy.

Most production uses a mixture of goods and services as inputs. It is useful to view the production process through the

metaphor of a ladder.(1) Towards the bottom of the ladder are relatively simple production processes, while towards the top are processes that are more complex and specialised. Different outputs — be they goods or services — use different production ladders.

The main idea is illustrated in **Figure 1** which gives an example of a manufacturing final good (aircraft manufacturing) and a final service (an airline). Within each there is a ladder with low and high value added services associated with them. The figure gives some concrete examples of goods and services at different rungs on the ladder.

Figure 1



Increasing the number of rungs on the ladder is a metaphor for technological sophistication. Progress is also made by finding ways of producing or sourcing goods or services at any point on the ladder that are cheaper and better. One of the key economic decisions for any firm is which goods and services to produce in-house and which to purchase in from other suppliers.

The sophistication in production that is possible in a given economy depends upon the level of skills in the workforce, the availability of infrastructure, access to capital and the 'institutions' that enable stable business planning and an effective legal and regulatory environment. These are the key productive capacities that support economic success and progress in an economy-wide sense. Looking across the world, the richest economies tend to produce more goods and services towards the top of the world ladder while those further down aspire to move up. In well-managed economies, productive capacities expand over time and with them a move in production to 'higher rung' activities.

This view of what generates economic progress chimes well with recent discussions about the importance of intangible capital in the investment performance of the UK economy. An influential study by the US Federal Reserve Board by Corrado, Hulten and Sichel (2004), estimated intangible investment to be around 13% of GDP in the late 1990s. Recent evidence for the United Kingdom, by Marrano and Haskel (2006) suggests that around 11% of nominal GDP in 2004 is in the form of intangible investment. They attribute half of this to efforts to build the 'economic competences' of firms in which they include firm-specific human and organisational capital. Other researchers, such as Bloom and van Reenen (2006) have similarly emphasised the importance of intangibles such as human resource management in firm-level productivity. Such intangibles are arguably areas where business services may play a key role in improving productivity. While it is too early to tell for sure, accounting for intangible investment may help to explain the surprising weakness of UK business investment in the early part of this decade.

Business services may also be important in changing the qualitative nature of relatively standardised inputs into a product that is designed for the specific needs of particular final and intermediate consumers. This typically involves being located physically close to these consumers.(2) But it also requires more co-ordination, better institutions, more sophisticated contracts and a higher level of skills from the workforce.

In recent years, we have seen all kinds of businesses outsourcing processes to achieve lower costs and to take advantage of gains from specialisation. Some of this is outsourcing of low value added activities, in part to low-wage economies. But the growth of business services in the United Kingdom reflects in part outsourcing of high value added activities which are high up the production ladder allowing firms to take advantage of the specialised skills available in business services. The latter, in particular, can be a source of productivity improvements. Business services are also often used directly in the outsourcing process.

The relocation of some production across the globe benefits advanced economies in two main ways. First, consumers and firms can buy these goods more cheaply and second, labour can be freed up from low value added tasks and redeployed further up the production ladder. The latter does require, however, that the workforce has the skills to relocate in higher rung activities.

The forces unleashed by globalisation in Asia follow this pattern. China has moved from a predominantly agricultural economy to labour-intensive manufactures. A more specific example from India is the production of car seats which has been an enormously successful growth industry and India is now one of the leading producers of car seats, selling them to many of the world's leading car manufacturers. But this is sustainable as a particular point in the value chain, reflecting the endowments and opportunities of Indian workers.

(1) See, for example, Grossman and Helpman (1991).
(2) See Hill (1999).

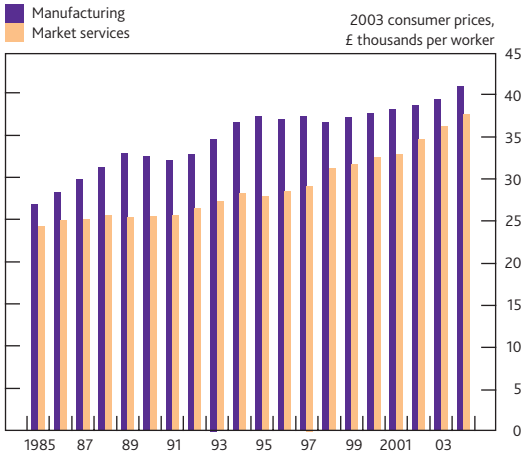
Much of the growth and structural change in the UK economy in recent years can be captured with the quality ladder metaphor. Growth has been achieved by moving into higher value added activities while reallocating resources from those further down the value chain. The latter has not always been from choice, with competitive forces playing a significant role in determining what is viable in the face of world competition. You are only too aware in Wales of the personal hardship that this can create. But the overall consequence has been a transformation in the UK manufacturing sector and the growth in services that I have documented above.

The achievements of the manufacturing sector over the recent period are considerable even though it represents a smaller share of the UK economy. It is clear that there are many success stories, and I have heard first hand about some of them during my visit here. In such cases, manufacturers have found their niche at a point in the value chain where they can exploit the considerable human resources and opportunities available in the United Kingdom.

But recognising the contribution of manufacturing does not validate the myths of deindustrialisation referred to above. I will briefly revisit each of them and show how applying the way of thinking that I am suggesting reveals each claim that I labelled as a myth above to be dubious.

To understand Myth 1, that services are necessarily low productivity activities, it is necessary to look beneath the aggregate picture. **Chart 7** shows that on average, the real value added income per service sector worker is lower than in manufacturing. Such figures, taken at face value, would perpetuate the myth that a movement towards services production must impoverish the UK economy.

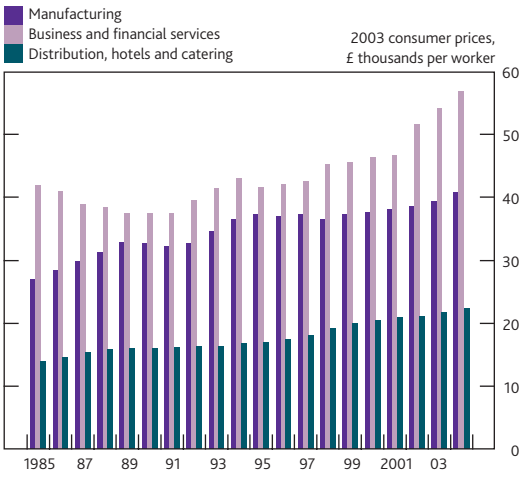
Chart 7 Real value added income per employee



Note: Real value added income per employee is calculated as nominal GVA divided by the number of workforce jobs and then deflated using the consumption deflator.

But looking at the market services' sectors separately, a somewhat different picture emerges. Not all service sector production is low value added and deploys workers less productively than in manufacturing. In terms of the quality ladder metaphor, it is clear that many service activities are indeed 'high rung' economic activities. The United Kingdom's strong global position in business and financial services is a case in point. **Chart 8** shows that real income per head in this sector exceeds income per head in manufacturing.

Chart 8 Real value added income per employee



Note: See note to **Chart 7**.

However, there is a central challenge. Globalisation has made it more difficult for less skilled workers whose jobs are more directly threatened by global competition. Some service sector jobs are less immune to global competition. **Chart 8** shows that gross real value added income per worker in distribution, hotels and catering is lower than in manufacturing. This is largely a reflection of these being relatively low-skilled sectors. Only by improving the skill base — particularly through investments in education and training — can this situation be changed.

The second myth is that services cannot benefit from productivity growth. One way to view this is given in **Charts 7** and **8**, which look at the changes in the level of real value added income per worker between 1985 and 2004. Both charts show that productivity looked at this way has been rising in services. The use of ICT is one important dimension of this. This is suggestive that innovation in services is important and can be a source of economic growth. This has been particularly important in business services which, as we argued above, are a key intermediate input into other economic activities (Oulton (2001)).

Finally, consider Myth 3 that the growth in services is detrimental to the UK trading position. It remains true that, relative to output, exports are higher in manufacturing than in services. Moreover, many consumer services are inherently non-tradable. For example, few people travel abroad to have their hair cut or their clothes dry cleaned. However, business

and financial services make an important contribution to net trade. For example, the sector accounted for a 23% share of UK exports in 2004. More generally, the services' trade balance was £23 billion in 2005, up from £9 billion in 1995. These earnings can be exchanged for goods produced from abroad. Moreover, these goods can frequently be purchased more cheaply from countries that have a comparative advantage in producing them.

It is clear that services have become increasingly more globalised in recent years. This is particularly evident since 1992 — the share of services exports in GDP nearly doubled between 1992 and 2005 as shown in **Chart 9**. Services exports and services imports together have increased from around 10% of GDP to over 15% in the same period (**Chart 10**).

Chart 9 Globalisation in services — share of services exports in nominal GDP — United Kingdom

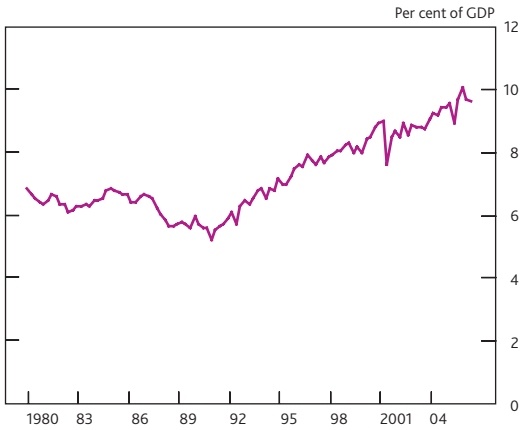
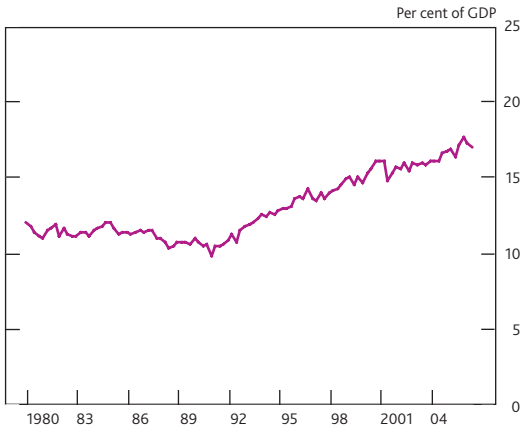


Chart 10 Globalisation in services — services imports and services exports as a share of nominal GDP — United Kingdom



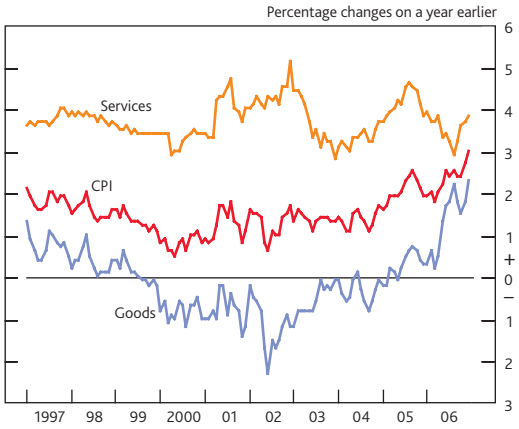
So let me summarise the story so far. The structural shift from manufacturing towards services is consistent with increasing prosperity and growth for the UK economy. What matters is not whether the output is in the form of services or manufacturing — it is the move towards the production of higher value added activities that enables the UK economy to progress. One of the key challenges is to maintain the skill base and to develop the right kind of business environment to permit continual movements of production up the value chain. The stability created by sound monetary policy plays a key role in delivering a favourable environment for business.

Services and inflation

The discussion so far has focused on the real economy and the implications of structural change in the UK economy for economic prosperity. But the primary concern of the MPC is with inflation and setting interest rate policy to achieve the inflation target. To do so effectively, we need to understand the forces that lie behind patterns of change in the UK economy and to use this to form a judgement of where inflation is going over the medium run. The kind of broad trends that I have described above are a part of the background against which interest rate policy is set.

Let me begin with the following 'eye-catching' fact about UK inflation which appears relevant to the discussion so far. **Chart 11** shows that, since 1997, there has been a persistent tendency for the rate of inflation in consumer services to run ahead of the rate of inflation in consumer goods.

Chart 11 CPI goods versus services in the United Kingdom

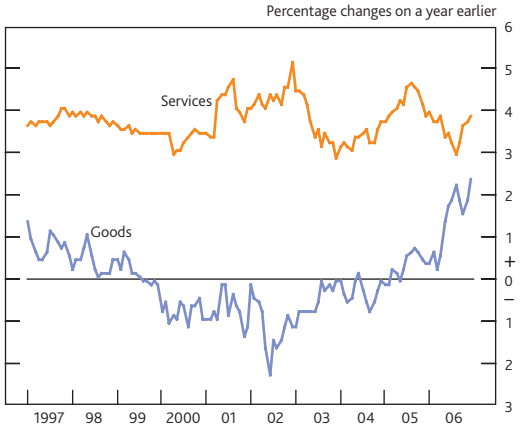


Note: Last data point December 2006.

It is worth noting that the UK experience depicted seems to be quite different from other advanced economies. To see this, I refer you to **Charts 12** to **17** which compare the rate of consumer service price inflation and consumer goods price inflation for the United Kingdom with that in France, Germany, Italy, Japan and the United States. None of these other countries shows a pattern that is anything like as clear-cut as the pattern that we see in the United Kingdom.(1)

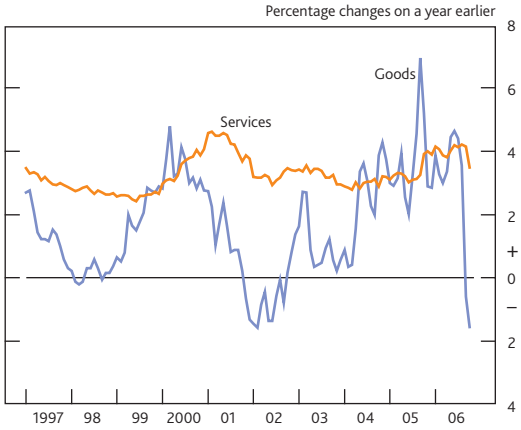
(1) While the reasons behind the international patterns require further analysis, developments in the sterling effective exchange rate index (ERI) over this period are likely to be an important explanatory factor.

Chart 12 CPI goods versus services — United Kingdom



Note: Last data point December 2006.

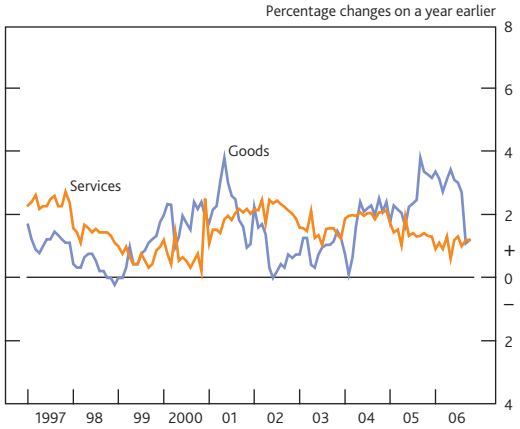
Chart 13 CPI goods versus services — United States



Note: Last data point October 2006. The methodology used to calculate US CPI and Japanese CPI differs from that used for UK CPI and from each other. US and Japanese CPI include imputed rents as services for example. See Lane and Schmidt (2006).

Source: Bureau of Labor Statistics.

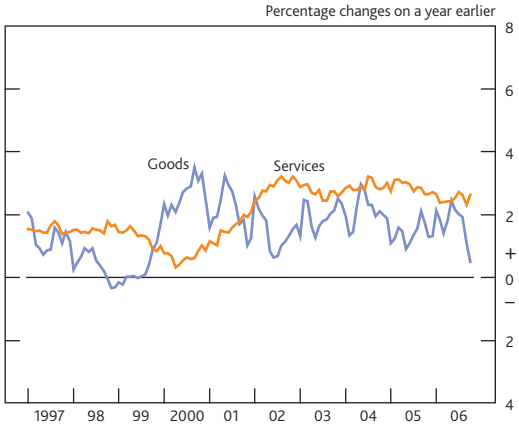
Chart 14 CPI goods versus services — Germany



Note: Last data point October 2006.

Source: Eurostat.

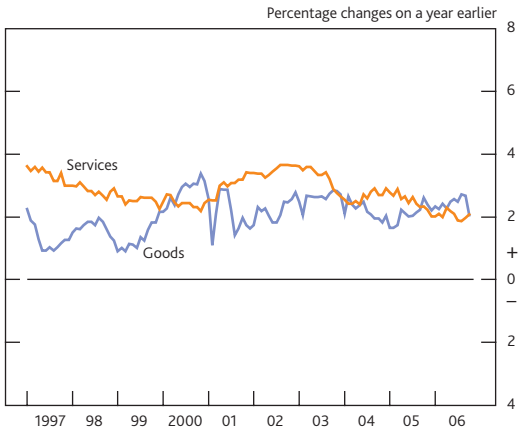
Chart 15 CPI goods versus services — France



Note: Last data point October 2006.

Source: Eurostat.

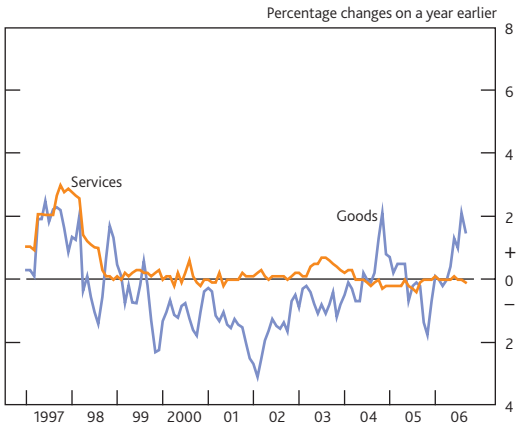
Chart 16 CPI goods versus services — Italy



Note: Last data point October 2006.

Source: Eurostat.

Chart 17 CPI goods versus services — Japan



Note: Last data point September 2006.

Source: Statistics Bureau of Japan.

When it comes to constructing a price index for services, there are a number of issues to be confronted. Some services, like haircuts, are fairly easy to define. But others present challenges. Take the case of the banking sector which was estimated to be around 5.2% of UK GDP for 2003. The difficulty lies in defining the output of banks. In principle, it is the flow of services that the bank provides to its customers. But calculating this flow, and then the corresponding price deflator, is not straightforward. One reason is that while there may be charges on some kinds of bank accounts, generally banks 'charge' by paying a lower return on deposits than they lend at. The ONS has to extract a measure of user cost from data on the stock of deposits, loans, wages, fees and interest rates.

Oulton (2004) and Allen (2005) highlight the methods by which this can be done. For example, the output measure of indirectly charged services is mainly the value of deposits plus loans. To derive the experimental Banking Service Producer Price Index (the average price per loan and interest-bearing deposit) from this, the number of large businesses outside of financial intermediation is used as a proxy for the number of loans and deposits. There are also issues when it comes to factoring services into National Accounts. For example, banking output needs to be allocated between domestic households, government, overseas residents and intermediate demand.(1)

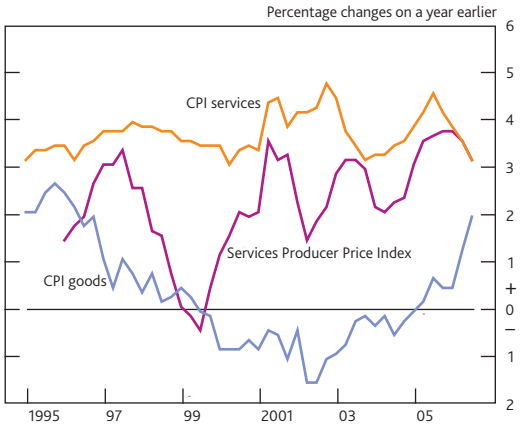
In summary, although services are now a large part of our economy and a crucial intermediate and final output, there are aspects of services measurement — both price and quantity — that are inherently more difficult than in the case of goods. This has implications for a body like the MPC and its attempts to understand what is happening in the UK economy.

Returning to **Chart 11**, there is a standard cost-based story, due to Baumol (1967), which explains why the relative price of labour-intensive services will tend to increase over time. If such services do not benefit from significant labour-saving technological change and wages are rising in the economy due to technological progress elsewhere, then we will tend to see this happening. This is sometimes referred to as 'Baumol's law'.

Baumol's law is also consistent with a larger share of national income being devoted to the production of services over time. This is because the demand for consumer services, restaurant meals being a good example, rises disproportionately with income.(2) Increased labour productivity in the non-service sector makes consumers as a whole richer and can lead to a larger share of income being devoted to consumer services even though services are becoming relatively more expensive.

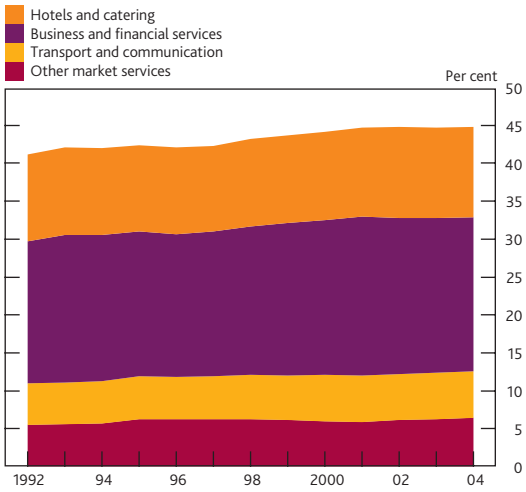
This view of what drives the finding in **Chart 11** is certainly plausible for an array of consumer services such as restaurants or hairdressers. But it is rather incomplete as an explanation of what has been happening to services in the United Kingdom. First, as we have already observed, much of the shift towards service sector output is in the form of producer services. In fact, service sector producer prices seem to be increasing at a higher rate than consumer goods prices — see **Chart 18**. This may be because, just as with final consumers, intermediate consumers spend a larger share of their revenue on services even as those services become relatively more expensive. And if such services are required more intensively further up the quality ladder, then this is consistent with business services also growing in importance. But such services may still be able to generate value added income as wages, profits and returns on capital, and pass less on to their intermediate and final consumers.

Chart 18 Inflation rates in goods and services



Note: The Services Producer Price Index is an experimental series.

Chart 19 Direct share of households' final demand for services



Note: Distribution and retail is not treated as a separate sector. Intermediate consumption for resale by the distribution sector is allocated directly to final demand by National Accounts convention.

(1) This allocation is related to the treatment of Financial Intermediate Services Indirectly Measured. See Tily and Jenkinson (2006).
(2) For example, Blundell, Pashardes and Weber (1993) estimate an income elasticity of demand of services by households of between 1.2 and 1.4 using data on 61,000 households from the British Family Expenditure Survey for 1970–84.

However, there is another issue raised by **Chart 11** which goes more to the heart of the judgements that concern the decisions made by the MPC. The trend observed in **Chart 11** constitutes a change in the relative price of consumer services and consumer goods while inflation refers to changes in the overall price level. What we can learn about relative price changes for overall inflation has been much debated. It is one of the main issues that has resurfaced in recent discussions about how monetary authorities should respond to the rise in energy prices, which is also a relative price change.

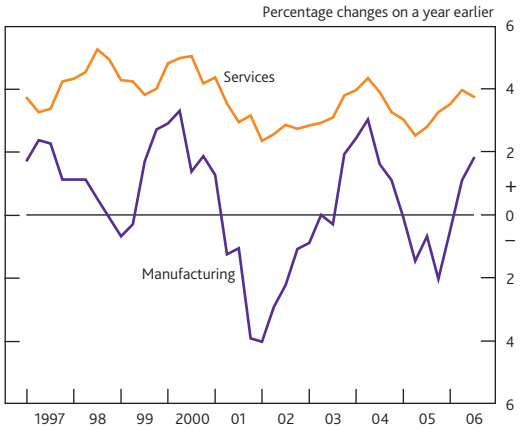
The rate of inflation is not determined in any one sector of the UK economy but by the balance of demand and potential supply in the UK economy as a whole. To keep inflation to the 2% target does not imply that all prices are rising at 2% — but that they do so on average. Experience of inflation 'on the ground' can be very different. We have heard plenty about the fact that pensioners, young single people and middle-class school-fee paying households experience inflation differently. But I have in mind something quite different — this is the fact that producers, who ultimately choose when to put up prices, experience different patterns of wage inflation and increases or falls in costs. Even in a world of stable inflation, there will be quite different underlying patterns of wage and price increases.

Returning to **Chart 11**, there is some evidence that it is the overall demand and supply conditions that determine the level of CPI inflation. Consumer services inflation and consumer goods inflation generally appear to move in opposite directions. This is quite unsurprising when consumers need to choose what to spend out of a given money income so that rising prices in some items implies less spending on others. Such rebalancing of consumer priorities has been an inevitable consequence of the recent increase in energy prices.

But even though it is the overall balance of supply and demand that matters, there are good reasons for assessing the current state of the UK economy by looking separately at goods and services. In particular, we are accustomed to the manufacturing and services sector moving at different speeds in the United Kingdom. Recent evidence suggests that the services sector is growing more strongly than manufacturing (see **Charts 20** and **21**). However, in mid-2006, the pickup in the euro-zone economies gave a boost to manufacturing which promised the possibility of some rebalancing between the service and manufacturing sector.

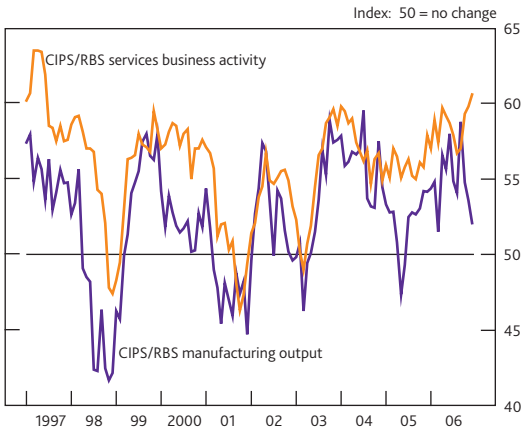
When the MPC assesses the state of the UK economy, it relies on a wide range of indicators. ONS data on output in manufacturing and services of the kind that we see in **Chart 20** are an important source. The recovery in manufacturing through 2006 is clearly visible from this. However, such data are available with a lag and are often subject to revision. Survey data from the Chartered Institute of Purchasing and Supply (CIPS) provide an important additional source of intelligence. **Chart 21** contains an additional quarter of data and shows that while still moving in a positive direction, the CIPS/RBS manufacturing output indicator declined somewhat towards the end of 2006. This contrasts with the CIPS/RBS service sector output indicator which has produced its highest reading for nearly ten years. While it is dangerous to put too much weight on a single number, this suggests a fairly robust picture.

Chart 20 ONS services and manufacturing output



Note: Data are quarterly. The last data point is 2006 Q3. Services here is total services and therefore includes non-market services from the public sector.

Chart 21 CIPS/RBS services and manufacturing output



Note: Data are monthly. The last data point is December 2006.

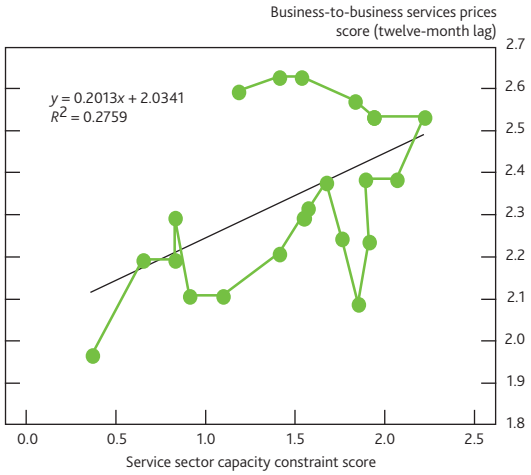
Source: CIPS/RBS.

A key issue in assessing the balance of supply and demand in the economy concerns the extent of capacity utilisation in the economy. One way of getting a feel for this is from a variety of surveys administered to the manufacturing and service sectors. A typical question asked to a firm is 'Are you currently operating: at full capacity/below full capacity?'. While quite crude, answers to these questions can be aggregated to give an economy-wide picture of spare capacity. An additional uncertainty in measuring spare capacity in the United Kingdom at the current time is that, with a plentiful supply of migrant labour, the concept of spare capacity is perhaps less well defined than in the past.

It is sometimes suggested that it is inherently more difficult to make such judgements in the service sector and hence, as the service sector grows as a share of the economy, our estimates of spare capacity become ever more imprecise. While it is correct that the surveys may give only an imprecise reading on the overall level of spare capacity, I don't subscribe to the view that the answers to these questions are less informative than similar questions answered for manufacturing. Historically, the coverage of the service sector in these surveys has, however, been less comprehensive, although we do now have a wider range of survey indicators to assess the state of the service sector.

There does, however, appear to be some relevant information in some such series. **Chart 22** matches Bank of England Agents' scores for service sector capacity utilisation against business-to-business service price pressures between 2005 and 2006 suggesting that there might be a relationship between the two.

Chart 22 Business-to-business prices versus service capacity constraints score (January 2005-November 2006)

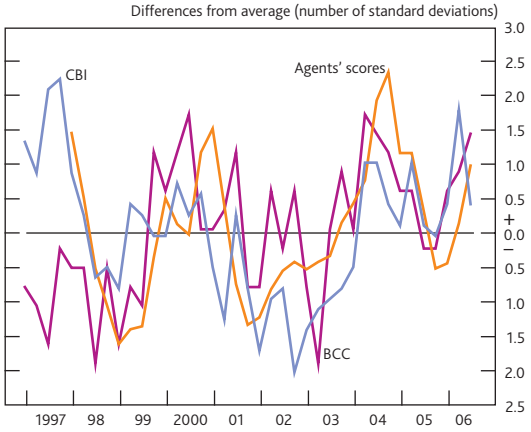


Note: The green data points represent Bank Agents' scores between January 2005 and November 2006. A score of zero indicates that prices over the past three months were unchanged compared with the same period a year earlier. A positive (negative) score indicated that prices were higher (lower) than a year earlier. Capacity constraint scores are over the next six months. Before January 2005, this score reflected companies' current situation, rather than being forward looking.

Charts 23, **24** and **25** plot the available series on capacity utilisation in manufacturing and services since 1997 from a variety of surveys. The general story is one in which capacity utilisation in services has been tighter in the period since 2004 than in the preceding three years. The CBI and BCC measures also show some modest tightening of capacity in manufacturing over the same period.

Putting all of this evidence together, we might reasonably expect inflationary pressure at the current time to be coming more from the services sector in the economy in part driven by limited spare capacity. Moreover, shortages of skilled labour in these sectors may lead to upward pressure on wages for such workers. Evidence from the BCC survey

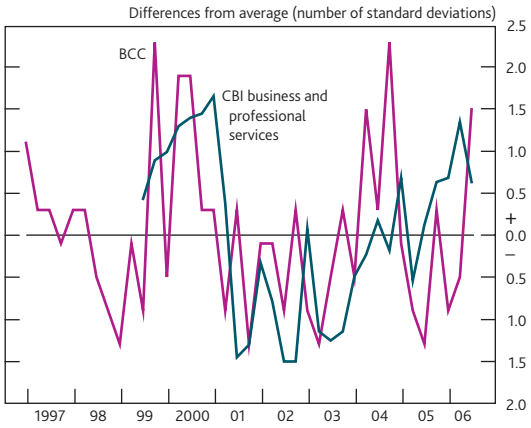
Chart 23 Capacity utilisation in manufacturing



Note: Data are quarterly. Final data point is 2006 Q3. Each series has been normalised by subtracting its mean and then dividing this value by the standard deviation. Means of BCC (35.9); CBI (38.5); Agents' scores (-0.75). Standard deviations of BCC (3.6); CBI (6.6); Agents' scores (0.66).

Sources: Bank of England, BCC and CBI.

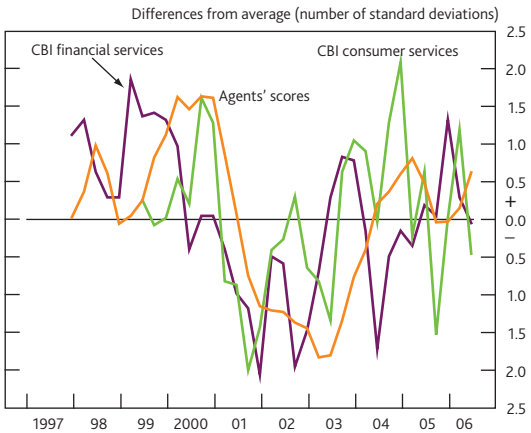
Chart 24 Capacity utilisation in services



Note: Data are quarterly. Final data point is 2006 Q3. Each series has been normalised by subtracting its mean and then dividing this value by the standard deviation. Means of BCC (38.3); CBI (-5.8). Standard deviations of BCC (2.5); CBI (19.6).

Sources: BCC and CBI.

Chart 25 Capacity utilisation in services



Note: Data are quarterly. Final data point is 2006 Q3. Each series has been normalised by subtracting its mean and then dividing this value by the standard deviation. Means of CBI financial services (4.8); CBI consumer services (-15.6); Agents' scores (1.4). Standard deviations of financial services (20.5); CBI consumer services (21.3); Agents' scores (0.9).

Sources: Bank of England and CBI.

suggests that the percentage of service sector firms reporting recruitment difficulties is currently close to its average.(1) To the extent that the economy is operating in a single labour market, this may lead to generalised wage pressure that will ultimately affect all firms in the economy.

I turn, finally, to a brief discussion of globalisation and its implications for services. There has been much recent discussion of globalisation and its implications for the UK economy as a whole and its implications for inflation. See Bean (2006). Most directly purchased consumer services are non-traded services and hence largely immune from the forces of global competition. But business services are not. We are only too familiar with relocation of call centres to low labour cost environments. Just as in the case of manufacturing that I discussed earlier, this should be thought of as a movement along the value chain allowing for labour in the United Kingdom to be redeployed more productively. It is consistent with the quality ladders view of economic change that I discussed above.

A frequently made argument is that global forces in the 1990s created favourable 'tailwinds' by reducing the prices of many kinds of manufactured goods. This may be a feature of trade in services and, we have already observed, there has been an increase in the share of trade devoted to services in the past fifteen years or so. It remains uncertain whether greater global competition in services will limit service sector price increases in future. However, whether or not this comes to pass, it is important to remember that the assessment of inflationary pressure requires looking at the balance between demand and supply overall.

In summary: we have observed a tendency for consumer services price inflation to run ahead of consumer goods price inflation over the past ten years. However, this does not imply an inflationary bias in the structural change from the production of services to goods. Changes in CPI depend on the balance of demand and supply factors in the economy as a whole. However, the current strength of the service sector, as evidenced in the survey data to which I have referred, is germane to judgements about the current strength of the UK economy.

Concluding remarks

This speech has focused on some broad trends in the UK economy that are likely to continue. I have argued that the growth of business and financial services is not necessarily damaging jobs and prosperity in the United Kingdom. Let me be clear that I am not trying to downplay the important role played by manufacturing in the United Kingdom. But the general context is one in which prosperity is maintained in both services and manufacturing by improving the skills base and business climate to support movements towards higher value added economic activities.

The forces of globalisation will continually put pressure on activities that are exposed to international competition. The United Kingdom is full of businesses — both manufacturing and services — that have shown themselves to be more than equal to the challenge of globalisation. The United Kingdom's economic performance from the 1990s onwards is one of an orderly structural shift in a context of broad macroeconomic stability and low inflation. There is little reason to believe that this will change in the future provided that the fundamentals remain in place.

The rise of the service sector has created challenges for the ONS which has to keep ahead of structural changes in the UK economy. As an MPC member, I will continue to keep my eye on the bigger picture and the forces that shape the balance of demand and potential supply in the economy as a whole. The fact that manufacturing series are more readily available and better measured should not give them undue emphasis in policy discussions.

One of the forces behind the success of the MPC since 1997 is the level of intelligent debate, analysis and commentary that the MPC has encouraged. The MPC does not only have to make the right policy decision, it also has to provide guidance about economic trends so that decision-makers throughout the economy can interpret their implications. The minutes of the meetings provide a key vehicle for communicating the views of the Committee. Those of our latest policy meeting, which will be published on 24 January, will explain the thinking behind last week's decision to raise Bank Rate by 25 basis points. The December minutes made clear the concerns about upside risks to inflation among some members of the MPC. Our decision this month must be viewed in that context and financial markets had already been pricing in an increase of around 25 basis points for February.

I have learned during my short tenure that there is an appetite for stories about process and personalities on the MPC. However, it is the economic issues that count in our decisions and following them provides the best guide to where interest rates are going. I accepted the invitation to join the MPC last summer on the premise that I would exercise my independent judgement in assessing what the data are telling us about trends in the UK economy. My decisions will be guided by this alone. This means recognising that we are uncertain about many things. But we do not live in a world that defies interpretation and uncertainty is not an excuse for inaction. The structural changes that have taken place, and will continue to take place, in the UK economy are important. Understanding them in a wider context does, I believe, lead to better policy.

(1) See Bank of England (2006).

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Recent developments in the UK labour market

In this speech,[1] Professor David Blanchflower,[2] member of the Monetary Policy Committee (MPC), discusses the potential implications of recent developments in the UK labour market on the wider economy and monetary policy. He argues that the equilibrium or natural rate of unemployment has fallen over the past decade, and posits a number of possible explanations, including changes in demographics and work patterns, and declining union membership. He argues that a fall in the natural rate would suggest there is currently a significant degree of slack in the labour market, and that wage growth should therefore remain benign in the near term — consistent with inflation returning to target by early Summer 2007.

It is great to be here in Scotland, which I am pleased to say is the third leg of what amounts to a gradual tour of the United Kingdom since I joined the MPC last June — I have already been to Wales and Eastern England, and I'm off to Southampton in May. As part of the MPC's efforts to understand what is happening across the economy, MPC members undertake regular trips to different parts of the United Kingdom. This supplements our assessment of the official data and surveys. Monetary policy is ultimately a judgement based on uncertain readings of what is happening and how things might pan out. So although I am talking tonight, my visit is also about listening and seeing.

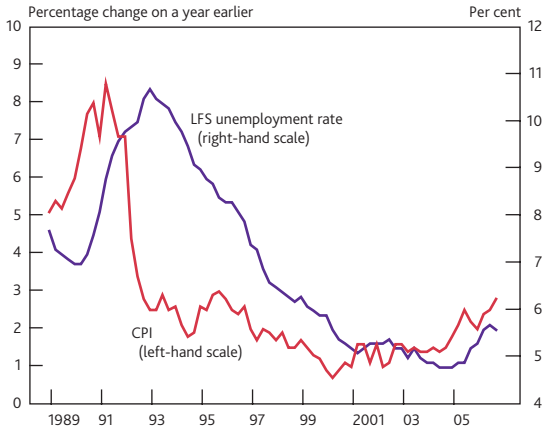
And as you may know, while I and my family live in the United States, I spend well over half of my working month in the United Kingdom, where I take part in MPC meetings and discussions and make regular speeches and visits — such as this one — to find out what is happening in the regions and countries of the United Kingdom. So I feel very much engaged in the process of setting UK interest rates. External MPC members are meant to be drawn from a variety of perspectives and backgrounds, and the common thread is that they must be experts in their fields. That is one of the strengths of the Committee. There is certainly no need for membership to be restricted to those that live in the Home Counties. In my view, the MPC is strengthened and discussion enriched by having different perspectives and backgrounds, so that we reach informed decisions that keep inflation close to target.

My plan tonight is to talk about recent developments in the UK labour market in some detail and then to briefly set out my thoughts on the outlook for growth and inflation.

Background

The period since a formal inflation target was adopted in the United Kingdom has been characterised by low and stable inflation, thus fulfilling the Bank of England's mandate to which I now find myself accountable. The stability of inflation has brought broad benefits to the economy, facilitating more rapid and less volatile economic expansion, which in turn has been associated with a decline in unemployment. Over the period 1976–96 RPIX inflation averaged 7.4% and since then it has averaged closer to 2.4%. CPI inflation fell from 7.5% in 1992 to an average of 1.5% since 1997 (**Chart 1**).

Chart 1 CPI and unemployment



The improvement in the performance of the economy is closely associated with inflation targeting and independence

(1) Given on 26 February 2007 at the University of Stirling. This speech can be found on the Bank's website at www.bankofengland.co.uk/publications/speeches/2007/speech302.pdf.

(2) I am most grateful to Chris Shadforth and Nicola Dufty for their invaluable assistance and Kate Barker, Charlie Bean, David Bell, Tim Besley, Bob Hart, Neal Hatch, Andrew Holder, Peter Rodgers and Andrew Wardlow for their helpful comments.

of the Bank. Our remit is to target CPI inflation at 2%. Furthermore, if CPI inflation falls below 1% or rises above 3%, as it nearly did in December, Governor King would have to write a letter to the Chancellor detailing the necessary actions to be taken by the Bank to bring inflation back to target. The surprise is that we have never had to do so. It doesn't look like we will have to for a while either as inflation is now falling steadily and likely to be back around, and probably well below target, by the end of the year.

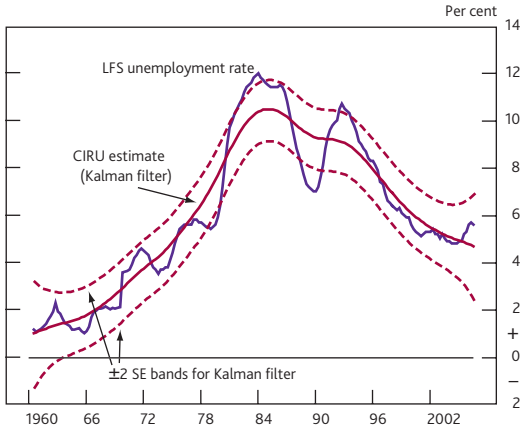
Over the years since inflation targeting was implemented the labour market has had an improved performance on almost every measure. The level of employment is set by the level of aggregate demand of course. Monetary policy has a significant impact on aggregate demand. As monetary policy is loosened aggregate demand rises and unemployment falls. At some point in a recovery labour shortages start to emerge along with rising inflationary pressures. The key question is how much unemployment remains before these pressures emerge. This level of sustainable unemployment can be thought of as the equilibrium rate at which there is no systematic tendency for inflation to rise and fall.

The equilibrium rate of unemployment is impacted by any variable that influences the ease by which an unemployed individual can be matched to available job vacancies and by any variable which raises wages in a direct fashion despite excess supply in the labour market. I refer to it as the equilibrium rate — or Constant Inflation Rate of Unemployment (CIRU) — rather than the NAIRU, following my predecessor on the MPC, Steve Nickell, who argued as follows:

> 'I prefer the equilibrium rate. The natural rate is a misnomer, as there is nothing natural about it and it can be systematically changed by some types of policy. NAIRU is a misnomer because it should be the constant inflation rate of unemployment, ie non-changing not non-accelerating' (2001, footnote 3, page 27.)

Chart 2 shows an estimate of the change in the equilibrium rate using a Kalman filter (see Staiger, Stock and Watson (2002)). It also includes two dotted lines to show the margins of error associated with this estimate. If we take the Kalman filter estimate at face value, it is apparent that the equilibrium rate has fallen steadily from around 10% in December 1985 to 4.6% in December 2006. This suggests that there is currently a considerable degree of slack in the labour market as the actual unemployment rate (5.5%) is well above the equilibrium level. Indeed, the amount of slack — as measured by the difference between the two rates — has not been this large since June 1994, when the unemployment rate was 9.4%. Of course, such estimates are not very good around end-points — emphasised by the widening of the error bands — and a measure extracted using a Hodrick-Prescott filter gives a number closer to the actual

Chart 2 The equilibrium rate of unemployment



Sources: ONS and own calculations.

unemployment rate, but my judgement is that the CIRU has fallen (Blanchflower *et al* (2007)).

The fall in the unemployment rate has reflected a number of factors. On the one hand, there has been a change in macrostability — unemployment has fallen in most, but not all, member countries of the OECD. On the other hand, there have been important microeconomic reforms. The most significant of these has been an increased onus on the unemployed to look for work, coupled with initiatives to help the effectiveness of their job search. The decline in the percentage of youths in the labour force, who typically have higher rates of unemployment, has also contributed. And the recent inflow of migrants from the A8, who are more likely to be in employment, has had the effect of reducing the equilibrium rate of unemployment. An increased emphasis on more flexible work patterns has also likely had an impact. Other reasons as to why the CIRU might have fallen include: the changed climate of industrial relations (Kersley *et al* (2006)) and the move to less centralised bargaining; a decline in union membership; and product market reforms (Wadhwani (2001)).

This lecture examines the causes and consequences of this improvement in broader terms, identifying the wider trends in the labour market over the past decade and more recently, and considering the prospects for the future. I consider six issues:

- unemployment;
- older workers;
- employment;
- wages and wage inequality;
- population growth and immigration; and
- the Scottish labour market.

Unemployment

Table A.1 sets out the major changes in the composition of the UK labour force for the period 1997–2006 Q4 in levels. **Table A.2** does the same for rates. Most notable is the decline

Table A.1 Recent developments in the UK labour market

Thousands

Year	16+ population	Work-force	Unemploy-ment	Employ-ment	Employees	Self-employed
1997	45,497	28,492	2,045	26,448	22,969	3,479
1998	45,661	28,497	1,783	26,713	23,327	3,386
1999	45,862	28,811	1,759	27,052	23,741	3,311
2000	46,107	29,071	1,638	27,434	24,174	3,260
2001	46,413	29,122	1,431	27,691	24,410	3,281
2002	46,704	29,399	1,533	27,866	24,526	3,340
2003	46,995	29,645	1,479	28,166	24,631	3,535
2004	47,324	29,839	1,429	28,410	24,780	3,630
2005 Q1	47,650	30,087	1,411	28,676	25,054	3,622
2005 Q2	47,753	30,126	1,433	28,693	25,063	3,630
2005 Q3	47,853	30,242	1,447	28,794	25,133	3,661
2005 Q4	47,946	30,312	1,554	28,758	25,059	3,699
2006 Q1	48,038	30,486	1,599	28,887	25,147	3,740
2006 Q2	48,131	30,613	1,683	28,930	25,211	3,719
2006 Q3	48,224	30,696	1,711	28,986	25,227	3,759
2006 Q4	48,316	30,723	1,687	29,036	25,242	3,794
Change 2005 Q4–2006 Q4	+370	+411	+133	+278	+183	+95

Notes: Employment includes employees, unpaid family workers and those on government schemes.
The self-employment rate is the proportion of those in employment that are self-employed.

Table A.2 Recent developments in the UK labour market — rates

Thousands

Year	Employment	Employment/ population	Activity	Self-employment
1997	7.2	58.1	62.6	13.2
1998	6.3	58.5	62.4	12.7
1999	6.1	59.0	62.8	12.2
2000	5.6	59.5	63.1	11.9
2001	4.9	59.7	62.7	11.8
2002	5.2	59.7	62.9	12.0
2003	5.0	59.9	63.1	12.6
2004	4.8	60.0	63.1	12.8
2005 Q1	4.7	60.2	63.1	12.6
2005 Q2	4.8	60.1	63.1	12.7
2005 Q3	4.8	60.2	63.2	12.7
2005 Q4	5.1	60.0	63.2	12.9
2006 Q1	5.2	60.1	63.5	12.9
2006 Q2	5.5	60.1	63.6	12.9
2006 Q3	5.6	60.1	63.7	13.0
2006 Q4	5.5	60.1	63.6	13.1

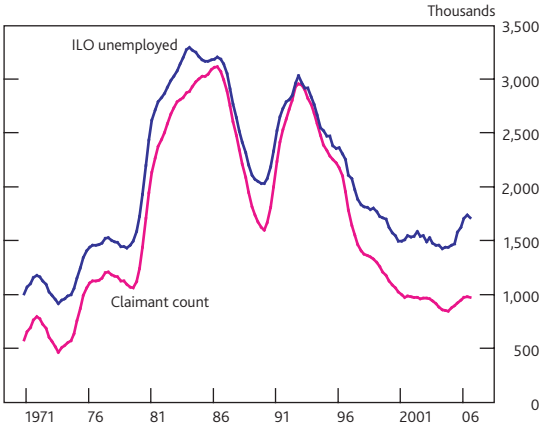
Notes: Employment includes employees, unpaid family workers and those on government schemes.
The self-employment rate is the proportion of those in employment that are self-employed.

in unemployment, with 300,000 fewer jobless individuals in 2006 than in 1997. Employment increased by more than 2.5 million over the same period. The unemployment rate thus fell from 7.2% to 5.5% between these years, while both the employment and activity rates rose. The self-employment rate was broadly the same in 2006 Q4 as it was in 1997.

There has been a significant improvement in the level of unemployment prevailing in the United Kingdom not just since 1997, but considerably earlier. The most notable feature of the immediate post-war era was of low rates of unemployment — which averaged 2.5% from 1945–75. This situation reversed itself at the end of the 1970s when the unemployment rate rose from 5.3% in June 1979 to 11.9% in June 1984. The rate declined to 6.9% in June 1990, then increased to a new peak rate of 10.6% in March 1993, and subsequently declined again until March 2005 to 4.7%. Since that date the unemployment rate has risen; at the time of writing (February 2007) the unemployment rate for December 2006 stood at 5.5%.

Chart 3 plots unemployment using two different measures, the claimant count based on the numbers claiming benefit and that based on the ILO count derived from the Labour Force Survey. It is notable that since the early 1990s, when unemployment was high and the two series gave very similar rates, the series have separated; the claimant count started to give a much lower rate of unemployment than the ILO series and has continued to do so. As an illustration of the difference, in 2004, there were 600,000 fewer benefit claimants than there were surveyed unemployed. In effect, around 40% of those who found themselves unemployed did not sign on, and that remains the case today. The principal reason behind the separation of the two series is probably the tightening of benefit rules, but rising immigration and rising participation of older workers are also likely to have contributed more recently.

Chart 3 Unemployment

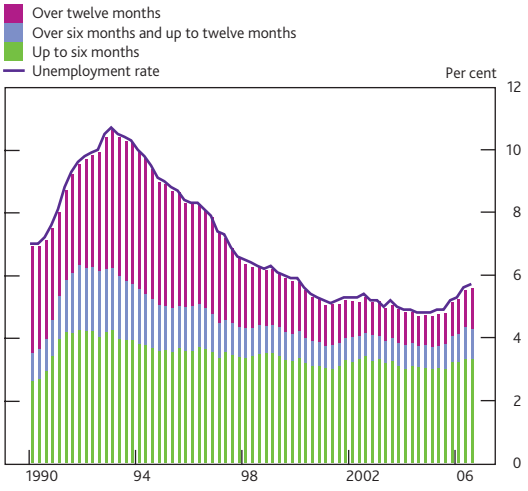


In the most recent data for October-December 2006, there was a decline of both ILO unemployment (-23,000) and in the claimant count (-13,500). This was dominated by a decline in unemployment among 18–24 year olds (-20,000) and over 50s (-20,000), partially offset by an increase in unemployment among 25–49 year olds. At the same time there was an increase in the numbers who were inactive (+66,000), with a notable increase of 37,000 in the number of 18–24 year olds who were inactive, which was considerably

higher than the decline in their unemployment numbers. There was also a small increase in the number of inactives reporting that they wanted a job (+5,000) as well as in the number of temporary workers reporting they couldn't find a permanent job (+30,000) and in part-timers saying they couldn't find a full-time job (+29,000).

Chart 4 shows the contributions to unemployment by duration. It is apparent that the decline in unemployment since 1997 was the result of a fall in the proportion of *long-term unemployed*. The contribution from those who have been unemployed for less than a year is much less volatile over the cycle, reflecting the fact that long periods of unemployment can reduce a worker's human capital. However, the proportion of the unemployed who have been continuously unemployed for at least twelve months rose from 19.8% in October-December 2004 to 23.5% in October-December 2006. The proportion of the claimant count continuously claiming unemployment benefit for at least twelve months also rose from 15.7% in November 2004 to 17.1% in January 2007.

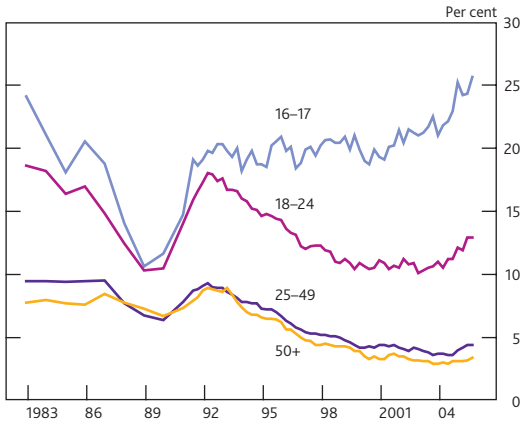
Chart 4 Duration of unemployment



The earlier movements reflect both the economic expansion of the period and the introduction of government policy aimed at assisting individuals back into work (for example, the New Deal programmes). The New Deal programmes are distinct for different groups of individuals, but each aims to improve the chances of individuals in finding jobs. For example, New Deal 25 Plus, which was introduced in 1998, is a mandatory programme designed to address the problems of long-term unemployment in individuals aged 25 and over. Those entering the scheme are initially offered advice on how to improve their chances of becoming employed, but should work not be forthcoming then they may be offered additional assistance, including a training allowance. The scheme appears to have been reasonably successful. An evaluation survey in 2004 found that three fifths of scheme participants had gone on to unsubsidised employment.(1)

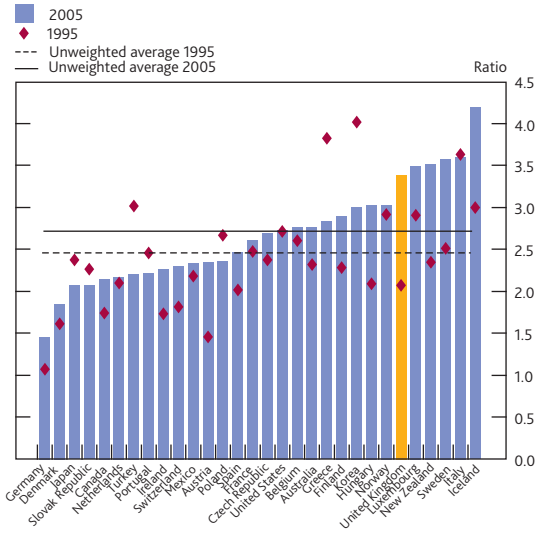
Chart 5, worryingly, shows that the unemployment rate of the young has picked up over time. Indeed, in 1997 18–24 year olds constituted 23.9% of the unemployed compared with 29.8% in October-December 2006. In addition, Quintini *et al* (2007) have noted that over the period 1995–2005 the United Kingdom had the largest increase in the ratio of youth to adult unemployment rates in the OECD (**Chart 6**); the United Kingdom moved from having a ratio below the OECD average in 1995 to being well above it in 2005.

Chart 5 Unemployment rates by age



Source: Labour Force Survey microdata.

Chart 6 Ratio of youth unemployment to adult unemployment



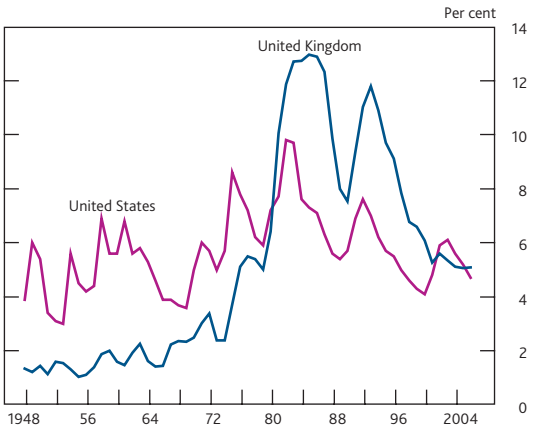
Source: Quintini *et al* (2007).

How does the unemployment rate in the United Kingdom compare to that in other countries?

It is apparent from **Chart 7** that for the period 1945–80 UK unemployment was below US unemployment, but during the 1980s and 1990s it was above it. Between 2002 and 2005

(1) PriceWaterhouseCoopers: www.delni.gov.uk/new-deal-25-plus-evaluation-report-no-9.

Chart 7 Unemployment rate



Sources: Bureau of Labor Statistics and ONS.

the UK rate was lower than the US rate, but returned to being above it in October 2005.

Unemployment in the United Kingdom is currently lower than the EU27, EU15 and euro-area averages for December 2006, of 7.5%, 7.1% and 7.6% respectively, but higher than, for example: Austria (4.6%); Denmark (3.2%); Ireland (4.4%); Luxembourg (4.8%); and the Netherlands (3.6%).(1) Interestingly though, the United Kingdom saw the second biggest increase in unemployment in the EU in 2006 on a year earlier of +0.4 percentage points; only Romania had a bigger increase. Unemployment rates among the member countries of the OECD declined from 6.4% to 5.8% between 2005 Q4 and 2006 Q4; the *only* member countries that experienced increases were the United Kingdom, Hungary and Luxembourg.(2)

Over the past decade, unemployment rates around the OECD have been lower than in the previous decade.(3) This is shown in **Table B**: the average unemployment rate for the period 1990–97 for the EU15, for example, was 9.6% from 1990–97 compared with 8.0% since then. Only in Germany, Austria and Japan was there no improvement. The performance of the UK labour market was significantly better than all other countries, except Ireland, based upon the extent to which the second-period average is below the first-period average.

What is the explanation for the improvement in unemployment in the United Kingdom?

In part it is likely to reflect global factors given the broad changes in observed unemployment rates in the OECD, principally, as stated earlier, macroeconomic stability. However, other important factors behind the decline in unemployment have been: reductions in the replacement rate in the United Kingdom along with tightening in benefit rules (Nickell (2006b); and the decline in union power in the United Kingdom. Union membership has been in decline since around 1980, having risen strongly during the 1970s. The

Table B Changes in unemployment rates in OECD countries, 1990–2006

Country	2006	Average 1990–97	Average 1998–06	Change (percentage points)	Change (per cent)
EU15	7.2	9.6	8.0	1.6	-16.6
EU12	7.6	9.6	8.6	1.0	-10.8
OECD Europe	7.6	9.0	8.5	0.5	-5.4
OECD	5.8	6.9	6.6	0.3	-4.1
Ireland	4.2	8.9	4.5	4.4	-49.1
United Kingdom	5.6	8.7	5.4	3.3	-38.6
Netherlands	3.8	4.6	3.5	1.1	-25.0
Spain	8.4	13.9	10.8	3.1	-21.9
Denmark	3.3	6.0	4.7	1.3	-21.4
United States	5.5	6.1	5.0	1.1	-17.5
Canada	6.1	8.5	7.1	1.4	-16.6
Finland	7.5	10.6	9.0	1.6	-15.4
Sweden	6.2	6.6	5.8	0.8	-12.8
Italy	6.9	9.5	8.7	0.8	-8.0
France	8.6	10.0	9.3	0.7	-7.2
Belgium	8.2	8.3	8.1	0.2	-2.4
Portugal	7.1	5.7	5.6	0.1	-1.6
Greece	8.7	9.9	9.8	0.1	-1.0
Austria	4.6	4.2	4.3	-0.1	+1.5
Germany	8.0	7.8	8.4	-0.6	+6.9
Japan	4.0	3.8	4.8	-1.0	+26.6

Source: www.oecd.org.

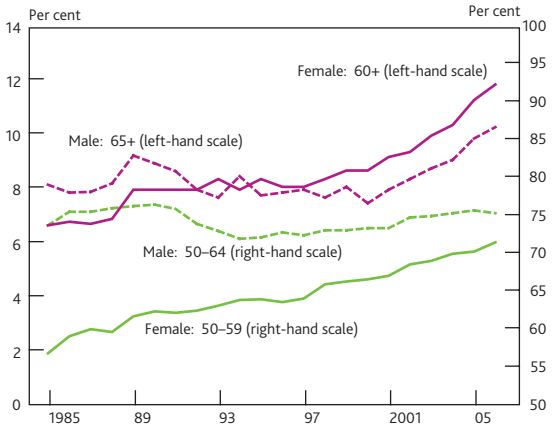
numbers of union members fell from a high point of approximately 13.2 million in 1979, to 6.7 million in 2005. Union density rates reached a high point in 1980 of 50.7%, and have fallen steadily since that point to 29% in 2005. In 2005, only 17.2% of British private sector employees were members compared with 58.6% of public sector employees (Grainger (2006)).

Older workers

It is clear from **Table A.2** that the activity rate has increased since 1997, but that hides very different trends by gender; the male participation rate has declined while the female rate has risen. Interestingly, the aggregate changes are primarily driven by changes in the participation rates of *older workers*, particularly for women (see Gutiérrez-Domènech and Bell (2004)). **Chart 8** shows that both the rates for women aged 50–59 and 60+ have risen steadily over time, whereas only the 65+ rate has risen for men. In contrast, for both men and women participation rates for those aged 18–24; 25–34; and 35–49 have been broadly flat, while participation rates for

(1) Source: *Labour Market Statistics, First Release*, February 2007, ONS, Table 19.
(2) Source: OECD *Economic Outlook*, 2007, downloadable at www.stats.oecd.org. The unemployment rate in Hungary rose from 7.2% to 7.5%, and Luxembourg from 4.5% to 4.8%.
(3) Data for the OECD are not strictly comparable over time because of the increase in membership by six member countries — Czech Republic: 21 December 1995; Hungary: 7 May 1996; Korea: 12 December 1996; Mexico: 18 May 1994; Poland: 22 November 1996; and Slovak Republic: 14 December 2000.

Chart 8 Participation by gender and age



those under 18 have declined to below 50% across both genders.

There are a number of suggestions as to why older workers have started to participate more in the labour market. One suggestion is that the most recent increases could reflect concerns over pension provisions in light of both the pension shortfalls announced by many firms, and low annuity rates. Other possible explanations are: changes in government policy that have reduced the ability of public sector workers to retire early; falls in the real value of statutory pensions; and increased life expectancy. The most recent increase in the inactivity rate likely reflects the inability of workers to find work — they are so-called discouraged workers.

Older workers who enter the labour force do not claim benefits or report being unemployed. They are disproportionately self-employed. In 2006, self-employed workers (aged 16+) were on average six years older than their employed counterparts (45.7 versus 39.7 respectively). **Chart 9** illustrates that the age distribution of the self-employed is skewed to the right, compared with that for employees. It seems plausible that younger workers are less likely to have the necessary human capital (experience) to become self-employed. They are probably also more likely to be credit constrained, limiting a larger proportion of them from starting a new business.

At the other end of the distribution, older workers face retirement, but that is not an issue for the self-employed. Indeed, many retirees (either at state pension age or earlier) may take advantage of the opportunity self-employment brings to remain in the workplace, providing their skills on their own terms. It is probably also fair to say that there is an element of risk in becoming self-employed, and this risk can be minimised if workers have previously ensured financial stability (eg mortgage paid off) by working for others.

What about the possibility that the increased participation of older workers has displaced younger workers? Blanchflower *et al* (2007) found that, despite the fact that activity rates among older workers had increased in all regions, there was no correlation between the increased activity rates of older workers and the increased unemployment rates of youths.

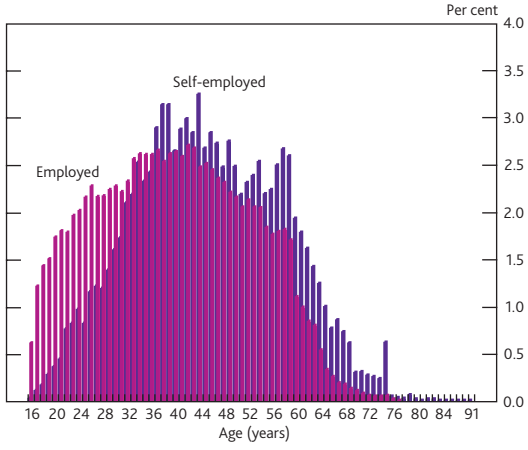
Employment

Since 2000, total employment in the United Kingdom has increased from 27,434,000 to 29,036,000, or 1,602,000. Of this, 549,000 entered self-employment and 530,000 the public sector. Hence, over the seven-year period 2000–06, approximately 70% of the growth in employment was in self-employment or the public sector (Hicks (2005)).

Self-employment

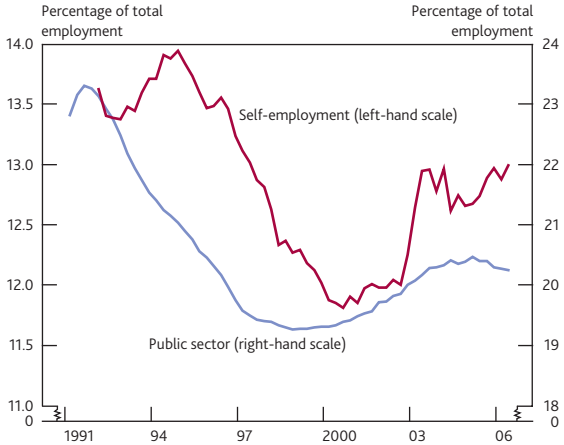
Self-employment as a proportion of the UK workforce is high by international standards. In October-December 2006, out of 29,036,000 workers, 3,794,000, or 13.1% were self-employed. The marked increase in the number of self-employed, and in the self-employment rate, in the 1980s is particularly notable as is the decline in the numbers and the rate during the 1990s (**Chart 10**).

Chart 9 Age distributions, 2006



Source: Labour Force Survey.

Chart 10 UK public sector employment and self-employment



It would appear the primary reason for the decline in the self-employment rate from 1995 until 2000 was a shift in a large number of workers from self-employment to employment within the construction industry. This reflected work by the Inland Revenue to stop employers treating employees as self-employed workers in order to avoid paying NICs, nor provide benefits, training or observe employment protection laws. While the total number of workers employed in the construction industry remained steady at just over 18 million between 1995 and 2000, the proportion of workers declaring themselves to be self-employed fell from 46% to 33%. By 1997, 200,000 construction workers had reclassified themselves as employees, explaining most of the reduction in self-employment in construction between 1995 and 1997. Following the downturn, the self-employment rate picked back up, to around 13% in 2006. Between September 2002 and September 2003 the number of self-employed increased by 280,000. During this period a number of tax changes were implemented, including: reform of capital gains tax; and reducing the rate of corporate tax on smaller companies. The largest increase in self-employment of 120,000 was found in banking, finance and insurance and was dominated by the 35–49 age group, although there were also large increases in the 50–64/59 and 65/60 and over age groups.

Public sector

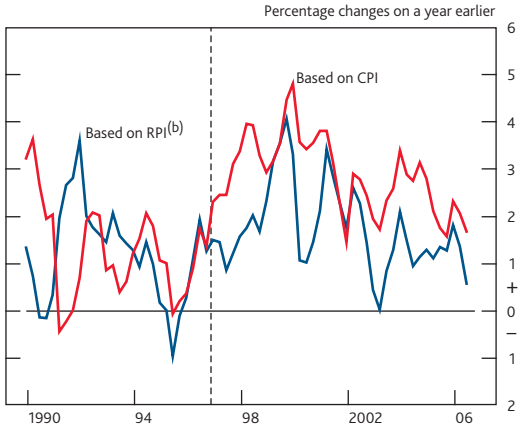
Both the proportion and number of employees working in the public sector rose significantly during the recession of the late 1980s, peaking at 23.3% of total employment in late 1991. Between June 1992 and June 1998, employment in the private sector grew by 1,865,000 (9.5%), while public sector employment declined by 741,000 (12.5%). Between June 1998 and June 2005, employment in the private sector increased by 1,281,000 (5.9%) compared with a rise in the public sector of 691,000 (13.4%). In September 2006, there were 5,855,000 public sector workers and 23,150,000 private sector workers (*Labour Market Statistics, First Release*, February 2007, Tables 3 and 4).

It seems unlikely that there will be similar growth in employment in the near future from the public sector (because of more stringent fiscal arrangements) or even from self-employment, which is cyclically rather volatile.

Wages, wage inequality and the National Minimum Wage

Chart 11 shows the evolution of real wages since 1990 using both the RPI and the CPI. It is apparent that real wage growth actually turned negative on these particular measures in the mid-1990s. However, this period was short-lived and the ensuing period of stability has led to strong growth in earnings. Nevertheless, growth has been flat or slowing on most measures since late 2004. It is also apparent that over the period 1997–2006 the gender earnings gap has narrowed. In

Chart 11 Real wage growth(a)

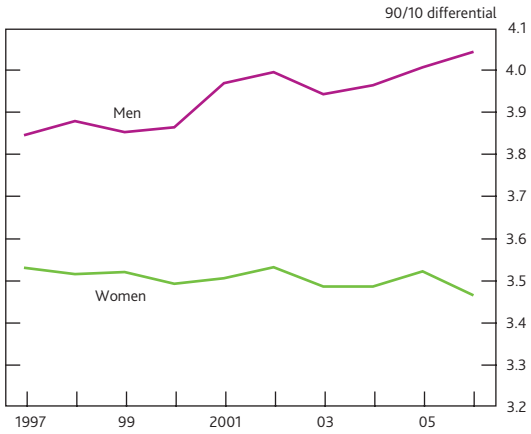


(a) Using average earnings index, whole economy including bonuses.
(b) Retail prices index, all-items.

1997 full-time median hourly earnings for men were 21% higher than for women based on ASHE/NES data. By 2006 the ratio was down to 14%.

There is evidence that earnings inequality has risen for men and fallen for women over the past decade. **Chart 12** shows that, based on ASHE/NES data for full-time hourly earnings, the value of the 90th percentile over the value of the 10th percentile earnings, or 90:10, increased for men whereas for women it declined. There was little change in the 50/10 for men or women, so the rise in earnings inequality is driven by increased male earnings above the 90th percentile. Katz *et al* (1995) found, using NES data, that there was a large increase in wage inequality among both males and females in Great Britain between 1980 and 1990. So the more recent results confirm a continuation of the previous trend for males, and a change for women.

Chart 12 Changes in earnings inequality



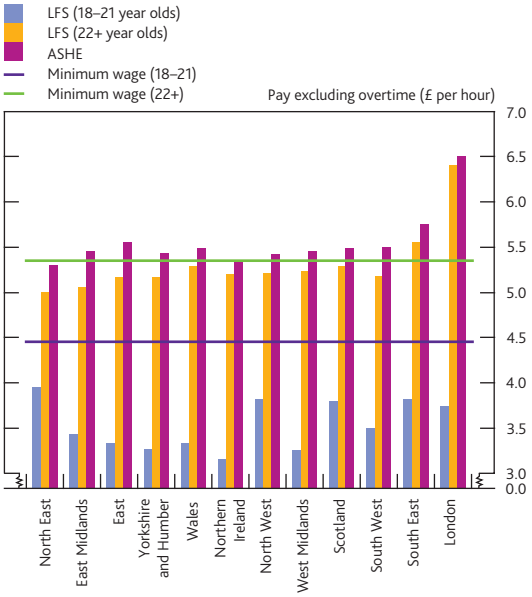
Source: *Annual Survey of Hours and Earnings*.

Rising earnings inequality has occurred despite the fact that a National Minimum Wage was introduced at £3.60 per hour for adults in April 1999. The rate has subsequently incrementally

increased, most recently to £5.35 on 1 October 2006.[1] There are additional, lower rates for those aged 18–21 and 16–17. The minimum wage is set nationwide in nominal terms and hence its real level varies markedly by region; being much higher outside London and the South East and that is where it is expected to bite (Stewart (2002)), because it will enter at a higher point on the wage distribution. The minimum is also most likely to bind for unskilled 22–24 year olds who are paid adult rates and 18 year olds who jump from the 16–17 year olds' rate.

Chart 13 shows how two of the latest NMW rates compare to wages at the bottom end (10th percentile) of the wage distribution in each region using ASHE, and additionally for each age group using the LFS microdata. According to the data, the newly announced minimum wages are likely to be a binding constraint for employers in all regions except London and the South East for the over 22s and in all regions for those aged 18–21. Taking the LFS data at face value, it is possible that employers may respond to (or have already responded to) the higher minimum wage rates by cutting back on employment. If that were the case, then one might argue that the natural rate of unemployment may have been pushed up recently.

Chart 13 Does the minimum wage bind in different regions?[a]

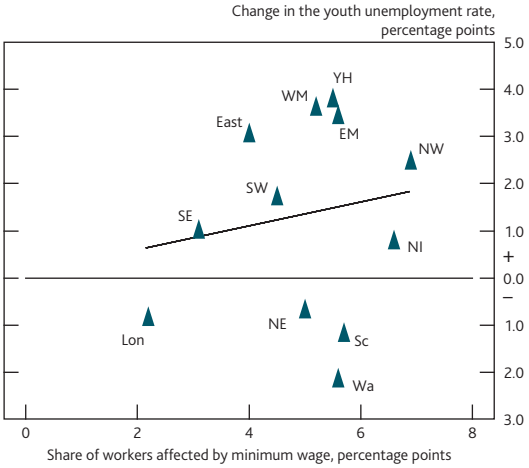


Sources: LFS microdata, 2005–06 Q3 and ONS.

(a) The chart excludes from the LFS data those earning less than £1 per hour.

There are estimates from the Department of Trade and Industry of the number of workers in each region who are likely to get a pay rise as a consequence of the recent rises in the NMW. We compute a measure of the 'share' of workers in each region who will be affected by the NMW[2] by dividing this DTI estimate by the total number of employees in each region. Against this we plot the change in youth unemployment between 2006 and 2005 (**Chart 14**). There is no statistically significant relationship between the share of workers hit by the NMW and the change in the youth unemployment rate.

Chart 14 Have regions hit the hardest by the National Minimum Wage seen the biggest rise in youth unemployment?



Sources: DTI, ONS and own calculations.

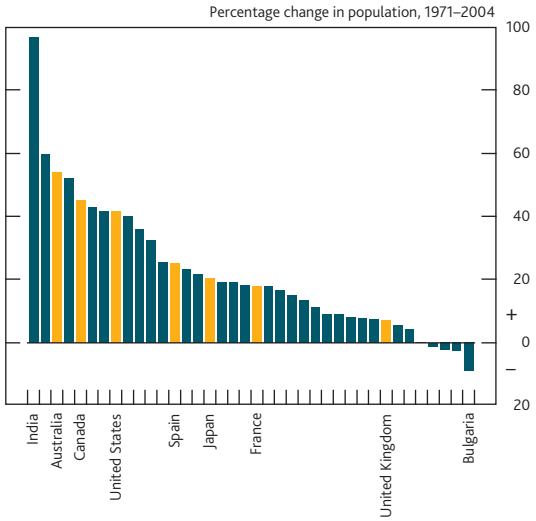
Most studies[3] have failed to find statistically significant evidence that the introduction of the NMW, and past increases to it, have had adverse effects on the demand for labour and employment. While it is too early to explicitly test the impact of the most recent increment, it is clear that if the NMW continues to rise then eventually it will start to have an impact on the amount of labour firms employ and the natural rate of unemployment.

Population growth and migration

Another important change in the labour market that has occurred recently is that the population has started to grow faster, predominantly as a result of an increase in net inward migration, rather than natural change. This is particularly important for regions where the inflow of immigrants has reversed long-term declines in, and aging of, populations. As I noted in a recent speech, population growth in the United Kingdom as a whole has been remarkably low by international standards over the past 35 years (**Chart 15**). Between 1971 and 2004, the UK population grew by just 7%, less than most of the other EU countries, Australia, Canada, Japan, New Zealand and the United States. However, the UK population is estimated to have grown at a faster pace since

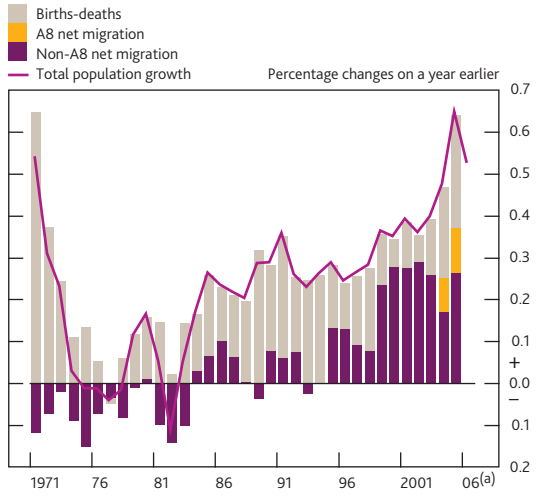
(1) Between April 1999 and October 2006 both the Adult and Development rates rose by approximately 48%. Earnings, as measured by the whole-economy AEI, have risen by 35% between April 1999 and September 2006 (both including and excluding bonus payments).
(2) See Department of Trade and Industry (2006), 'Government evidence to the Low Pay Commission on the economic effects of the National Minimum Wage', Table F2.
(3) See for example Dickens and Draca (2005) and Stewart (2002).

Chart 15 Population growth, 1971–2004



Sources: Blanchflower *et al* (2007), Eurostat, *Health Statistics Quarterly*, Vol. 32, Winter 2006 and *US Statistical Abstract 2006*.

Chart 16 UK population growth



(a) Official disaggregated data are not yet available for 2006.

the turn of the millennium, rising by 1.8 million (3.2%) since 2000 (**Chart 16**).

The main cause of this increase has been an increase in net inward migration; the ratio of births to deaths has seen less variation. Both the inflow and outflow rates have risen, but the inflow rate has risen more rapidly, with an influx of migrants from eight East European countries — known as the Accession 8, or A8 for brevity (the Czech Republic; Estonia; Hungary; Latvia; Lithuania; Poland; Slovakia; and Slovenia). As you may have gathered from press coverage, the numerical flow has been particularly large from Poland, but as a proportion of the home population, the flow has been especially dramatic from Lithuania and Latvia. Approximately 1.6% of the home population of Lithuania and 1.25% for Latvia have come to the United Kingdom in the past two years according to one data source, compared with 0.8% from Poland and 0.2% from Hungary.

It appears that 500,000 workers are likely to be an upper estimate of the number of A8 migrants that could potentially be in the United Kingdom in late 2006. But the data suggest that as many as half of the migrants that have come to the United Kingdom have not stayed permanently. There is little or no evidence to suggest that the new A8 migrants have come to the United Kingdom to claim or receive benefits: they have come to work.

Of particular interest to this region is the finding in **Table C** which suggests that Scotland's declining population has now been reversed. Since 2002, the Scottish population has been growing as a result of growth in net migration: this occurred despite the fact that the number of deaths continues to outstrip the number of births. Between 2004 Q3 and 2006 Q3, 37,570 workers from the A8 registered in Scotland under the Worker Registration Scheme (WRS) — see Blanchflower *et al* (2007). Note that the self-employed do not need to register on the WRS, but they do need a National Insurance Number (NINo). During 2005–06, 41,400 workers registered in Scotland for National Insurance Numbers.

These new immigrants are in general much younger than the native population. The average age of someone born in the United Kingdom and living in Scotland in 2006 was 40, compared with 26 for foreign-born inhabitants. According to the Labour Force Survey, the greatest proportion of these new immigrants who have come to Scotland are also from the A8, accounting for one in five of the arrivals since 2002. A similar proportion has come from other EU countries, with the rest coming fairly evenly from other countries around the globe.

It is plausible, of course, that an influx of immigrants could displace natives or less recent immigrants, but there seems little evidence to sustain such a view. The recent influx of A8 workers into the United Kingdom would not appear to have had many displacement effects on native workers — consistent with a large literature on the subject — demonstrated by the continuation of the fall in the unemployment rate; these new workers would appear to have complementary skills to the native labour force.

Gilpin *et al* (2006) recently conducted a careful econometric analysis of the impact of the new A8 migrants. In particular they focused on their impact on the claimant count, as this is not a sample. They found that:

> 'despite anecdotal evidence, there is no discernible statistical evidence which supports the view that the inflow of A8 migrants is contributing to a rise in claimant unemployment in the UK' (2006, page 49).

Table C Population changes, 1971–2004/05

Thousands

Mid-year to mid-year	Population at start of period	Population at end of period	Total annual average change	Components of change (mid-year to mid-year or annual averages)			
				Live births	Deaths	Natural change	Migration
England and Wales							
1971–76	49,152	49,459	+ 61	644	588	+ 76	-28
1976–81	49,459	49,634	+ 35	612	582	+ 30	-9
1981–86	49,634	49,999	+ 73	639	582	+ 57	+ 16
1986–91	49,999	50,748	+150	689	569	+120	+ 30
1991–96	50,748	51,410	+132	668	563	+106	+ 27
1996–97	51,410	51,560	+149	655	562	+ 93	+ 56
1997–98	51,560	51,720	+160	636	544	+ 92	+ 68
1998–99	51,720	51,933	+213	630	558	+ 72	+141
1999–2000	51,933	52,140	+207	612	550	+ 61	+146
2000–01	52,140	52,360	+220	599	528	+ 71	+149
2001–02	52,360	52,570	+210	591	530	+ 61	+149
2002–03	52,570	52,794	+223	608	532	+ 76	+147
2003–04	52,794	53,046	+252	631	531	+101	+151
2004–05	53,046	53,390	+345	641	520	+ 121	+ 224
Scotland							
1971–76	5,236	5,233	—	73	64	+ 9	-14
1976–81	5,233	5,180	-11	66	64	+ 2	-16
1981–86	5,180	5,112	-4	66	64	+ 2	-16
1986–91	5,112	5,083	-6	66	62	+ 3	-9
1991–96	5,083	5,092	+ 2	63	61	+ 1	-0
1996–97	5,092	5,083	-9	60	60	—	-9
1997–98	5,083	5,077	-6	58	59	-1	-6
1998–99	5,077	5,072	-5	57	60	-4	-1
1999–2000	5,072	5,063	-9	54	60	-6	-3
2000–01	5,063	5,064	+ 1	53	57	-4	+ 5
2001–02	5,064	5,055	-9	51	57	-6	-3
2002–03	5,055	5,057	+ 3	52	58	-7	+ 9
2003–04	5,057	5,078	+ 21	54	58	-4	+ 25
2004–05	5,078	5,095	+ 16	54	57	-2	+ 19

Immigrant labour can lower the natural rate of unemployment, either by filling skill gaps (assuming that foreign-born workers are complementary to the domestic workforce) or by tempering wage demands, as wage bargainers become aware that they can be replaced more easily than in the past. In support of the latter argument, the OECD *Economic Outlook* (2006) notes that 'international as well as UK evidence suggests [that] immigration can serve to make the labour market as a whole more fluid and wages less sensitive to demand fluctuations'. Katz and Krueger (1999) argue that recruitment agencies for temporary workers also contribute to declines in the natural rate, where A8 migrants are disproportionately employed (Blanchflower *et al* (2007)).

Shimer (1998) argues that time series changes in the natural rate of unemployment in the United States are driven by demographic changes; the declining natural rate of unemployment over the past decade or so has resulted from declines in the proportion of individuals in the population that had high propensities for unemployment. So the aging of the baby-boom generation was particularly important as the proportion of the population that was young — and subject to high unemployment rates — declined over time. Barwell (2000) found, using data from the Labour Force Survey that about 55 basis points of the 565 basis points fall in the UK unemployment rate between 1984 and 1998 can be accounted for by changes in the age structure of the labour force. A more recent analogy for the United Kingdom is that the workforce has increased in size as a result of adding a group — the A8 — with a relatively low propensity to be unemployed(1) and claim benefits. The workforce appears

(1) Microdata suggest that, holding constant a variety of characteristics including age, qualifications and location, recent A8 immigrants have higher self-employment rates and lower wages than natives, but similar unemployment rates. In contrast, recent non-A8 migrants have a higher probability of being unemployed, comparable wages and lower self-employment rates than natives. A8 migrants who arrived before 2004 have very low unemployment rates and high self-employment rates, but lower wage rates than natives. The data also suggest that the mix of skills that these A8 migrants have brought to the United Kingdom are complementary to the existing workforce, so displacement of native workers is unlikely to have been much of an issue in aggregate.

more flexible and mobile than it was before the entry of workers from the A8. They had no entitlement to benefits so the replacement rate in the economy has fallen, once again lowering the natural rate of unemployment.

These A8 migrants are also likely to have had an effect on the wage-bargaining process, lowering the bargaining power of native workers. The 'fear' of unemployment has risen (Blanchflower (1991)). Consequently, a secondary effect of the influx of A8 migrants has been to reduce inflationary pressures by lowering wage pressures.

Evidence suggesting that there is greater wage flexibility in the United Kingdom than in the past is presented in **Table D** (Blanchflower and Oswald (1994a, b)). It estimates a set of log hourly wage equations. As one moves to the right various controls (dummies for year, region, age, sex, race and schooling) are added. The final column includes an interaction term between A8 migrants and the unemployment rate, which is significantly negative. This suggests that the wages of A8 migrants are more flexible than those of other workers.

Table D Wage curves for the United Kingdom

Thousands

	(1)	(2)	(3)	(4)
Log regional unemployment	-.0349 (0.69)	-.0457 (3.37)	0.0517 (4.78)	-0.0512(4.68)
Log U * a8 migrant				-0.143 (12.09)
Log U * nona8 migrant				0.003 (0.65)
Age			0.0956 (158.00)	0.0956 (158.00)
Age^2			-0.0011 (141.84)	-0.001 (141.84)
Male			0.2628 (51.43)	0.2628 (51.43)
Asian			-0.162 (18.46)	-0.162 (18.46)
Black			-0.1782 (0.97)	-0.1782 (10.97)
Chinese			-0.0784 (4.62)	-0.0784 (4.62)
Other races			-0.0984 (8.14)	-0.0984 (8.14)
Age left school			0.0083 (5.57)	0.0082 (5.57)
Year dummies	Yes	Yes	Yes	Yes
Region dummies	No	Yes	Yes	Yes
Constant	2.3071	2.2384	0.0435	0.0463
R^2	0.0539	0.0852	0.2315	0.2318
N	662,716	662,716	644,626	646,626

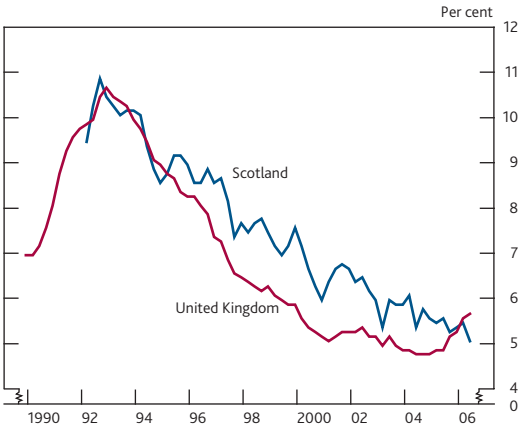
Notes: Standard errors clustered by region and year. Dependent variable log of hourly wage derived from hourpay variable. T-statistics in parentheses.

Source: LFS 1996–2006.

The Scottish labour market

It is appropriate to have a brief look at the Scottish labour market, which has been doing pretty well recently. **Chart 17** shows that unemployment in Scotland is now below the UK average for the first time in more than a decade.(1) Currently, the Scottish unemployment rate is 5.2% compared with 5.5% for the United Kingdom as whole. The employment rate in Scotland is 76.1% compared with 74.5% for the United Kingdom and the activity rate is 80.3%, compared with 79.0% for the United Kingdom. The claimant count for 18–24 year olds in January 2007 in Scotland was lower than a year earlier, whereas nationally it was higher. So on all of these measures Scotland is doing well.

Chart 17 Unemployment rate in Scotland



A Scottish success story is also apparent in a number of other labour market indicators. The number of economically inactive individuals in Scotland reporting that they are looking for a job has declined steadily over the past three years, whereas nationally the number has increased. Similarly, the numbers of part-time workers in Scotland who say they can't find a full-time job has stayed broadly constant, whereas nationally it has increased. And the number of temporary workers who say they can't find a permanent job has declined in Scotland, since December 2003.

The strength of the Scottish labour market, and UK labour market in general, would lead me to expect to see a further improvement in the incapacity benefit data. These data are produced with a significant lag and are only available nationally, but they indicate that the incapacity benefit caseload fell by 42,000 to 2.68 million in the year to August 2006. The number of people claiming workless benefits (unemployment benefits, incapacity benefit and income support) in Scotland was approximately 483,000 in February 2006. This is a reduction of over 14,900 since the same period in 2005.(2)

In terms of earnings, **Chart 18** suggests that the relative strength of the Scottish labour market, in comparison with the United Kingdom, has been reflected in a pickup in earnings in Scotland. Median, full-time, weekly earnings have been rising faster in Scotland than the United Kingdom since around 2004. The obvious question is, as with other UK regions,

(1) *Labour Market Statistics, First Release*, February 2007, ONS and *Labour Market Statistics, First Release*: Scotland, February 2007, ONS.
(2) www.scotland.gov.uk/Topics/Statistics/Browse/Labour-Market/TrendWorklessness.

Chart 18 UK and Scottish wages[a]

Source: *Annual Survey of Hours and Earnings*, ONS.

(a) Median, full-time gross weekly earnings.

whether this improvement will continue in the future given three increases in interest rates and a strong pound.

Summary

In summary, I have identified a number of key, recent labour market developments in the United Kingdom. These include:

- Unemployment is currently high relative to CIRU — this would conventionally be interpreted as evidence of an 'unemployment gap' and a relatively weak labour market.
- There have been increases in both youth and long-term unemployment.
- The joint movements of unemployment and inactivity have to be interpreted with care when trying to draw inferences regarding the tightness of the UK labour market.
- The UK labour market has become more flexible with the enlargement of the EU and increased pool of potential workers.
- The expansion of the EU and increases in the proportion of workers describing themselves as temporary are likely to weaken 'outsider' pressure on wage costs.
- Scottish labour market performance has been strong in recent years.

So what are the implications for inflationary pressures?

In my view, the labour market for the United Kingdom, as a whole, has continued to loosen over the past twelve months or so. Labour demand has remained firm or picked up in many sectors, but on the whole has not kept pace with the additional supply. Consequently, while employment has risen, so too has the degree of slack in the labour market.

There has been no evidence in the past twelve months or so of any pickup in earnings growth. Indeed, the ONS on its website describes pay growth as 'steady'. The average earnings index and average weekly earnings have shown little or no tendency to increase; if anything they have declined slightly over the past twelve months or so. Average earnings excluding bonuses, averaged over three months rose by 3.7% in the year to November 2006, compared with 3.8% in November 2005 and 4.4% in November 2004. **Chart 19** illustrates. Wage settlements have also so far remained low, and labour costs have fallen as a result of an increase in hours worked (**Chart 20**). Public sector wage increases appear to be averaging around 2.5%, which is the same as last year. For example, 482,000 teachers received 2.5% as part of a 2½ year deal and 140,000 police settled at 3%. Wage pressures are likely to remain benign given that the profit share of companies is low and the fear of unemployment is high (Blanchflower (1991)).

Chart 19 Whole-economy regular pay: AEI versus AWE (three-month average, annual rates)

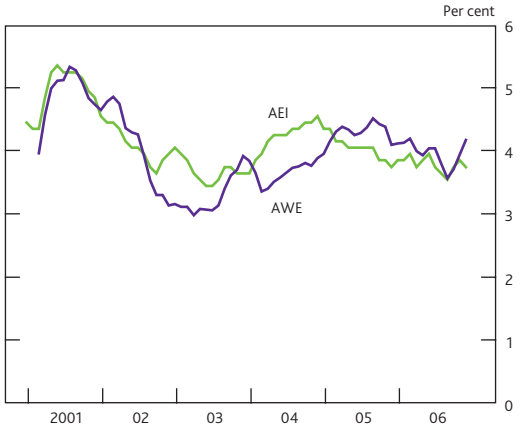
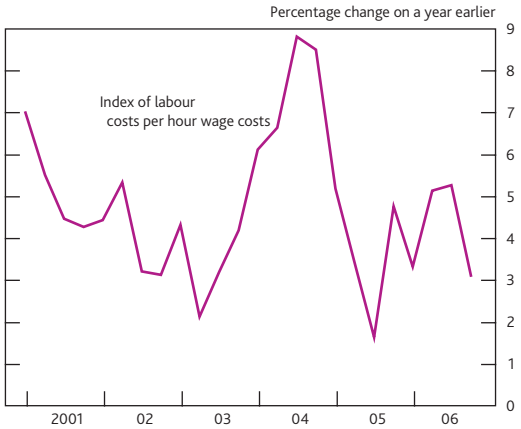


Chart 20 Whole-economy index of labour costs per hour



The other major considerations in terms of monetary policy are: the degree of spare capacity within firms; and inflation expectations.

Capacity utilisation within manufacturing firms such as measured by the BCC and the CBI as well as the Bank's Agents continue to be around the average for the past decade. The BCC long-run survey measure of capacity within services is also around its ten-year average. There is a considerable degree of disagreement over the level of the output gap prevailing in the UK economy — which is the sum of capacity within firms and in the labour market. This is notoriously difficult to measure — indeed it isn't directly observable. My view is that slack in firms has remained broadly constant over the past year or so and the slack in the labour market has continued to increase. The output gap in my view continues to increase in size, suggesting that the potential for the economy to grow in a non-inflationary way is substantial. The pound is now higher and three interest rate rises have yet to have their full impact, alongside the fact that the natural rate of unemployment has fallen.

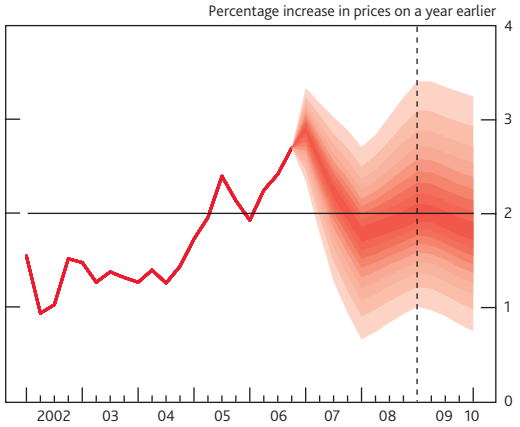
Inflation expectations are less likely to be dislodged in the event of a cost shock if the monetary framework is credible. It seems to me that monetary policy in the United Kingdom *does* have credibility and inflationary expectations are well anchored on the inflation target. In such a case a rise in 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 (2006a) 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'.

If inflation persists above the 2% target for too long the worry is that individuals 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 expectations appear to have fallen back. The most recent YouGov/Citigroup survey data for February indicate a median expectation that consumer price inflation will be around 2.4% over the next year, down from 2.7% in January and the lowest level seen since November last year. The survey also recorded a fall in average expected inflation over a five to ten-year time span. I expect these measures to continue to fall as inflation steadily declines, as it surely will, driven by base effects and the recently announced cuts in gas and electricity prices. I expect inflation to be back at target by late Spring/early Summer 2007.

The latest *Inflation Report* projections, February 2007

The Committee's projection for the probability of various outcomes for CPI inflation in the future is given by **Chart 21**, 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 10 of those occasions.

Chart 21 CPI projection: February 2007 *Inflation Report*



The inflation profile is a little higher than in the November *Inflation Report* in the near term, but then falls back a little further. There are differences of view among the Committee concerning the central projection. My own particular view is that there is a slightly greater margin of spare resources in the economy than embodied in the central projection, reflecting both greater spare capacity within businesses, and a greater degree of slack in the labour market. I therefore believe that inflation will recede more quickly and to a greater extent than the profile shown in **Chart 21**, and be below target at the two-year horizon. Other Committee members subscribe to a view that pricing pressures may prove stronger than in the central projection, as a result of strong demand and high asset values. The uncertainties about the outlook for inflation, as in November, continue to be judged to be somewhat greater than normal, and I, like every other Committee member, stand ready to act appropriately given future developments.

The uncertainty, in conjunction with the margin of spare capacity within firms and in the labour market, additionally reflects concerns regarding the evolution of the exchange rate and prospects for world growth, among others.

The world economy looks a little stronger now than it did six months ago. The most recent FOMC decision (31 January) yielded a continuation of the pause in policy tightening first abated at their August meeting. However, the FOMC's statement suggested that there now appears to be a more favourable growth/inflation trade-off for the United States, reflecting recent data releases. There appears to have been a soft-landing in the housing market. The pickup in euro-area

demand, perhaps with the exception of Germany, seems to be continuing.

The exchange rate has risen significantly over the past few months and has contributed to the degree of monetary tightening facing the UK economy. It is uncertain where the exchange rate will move next, but looking ahead, the MPC assumes sterling will gently fall back over the next couple of years.

That being said, it is my principal belief that the evolution of the labour market will dictate to a significant extent the prospects for the UK economy and inflation in coming months.

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Appendices

Bank of England speeches

Speeches made by Bank personnel since publication of the previous *Bulletin* are listed below.

The MPC comes of age

(Reproduced on pages 106–11 of this *Bulletin*.)
Speech by Rachel Lomax at the De Montfort University, Leicester on 28 February 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech303.pdf

Recent developments in the UK labour market

(Reproduced on pages 158–72 of this *Bulletin*.)
Speech by Professor David Blanchflower at the University of Stirling on 26 February 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech302.pdf

Speech on the economic outlook

Charles Bean to a business audience at the Galpharm Stadium, Huddersfield on 21 February 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech301.pdf

Speech by Mervyn King, Governor

(Reproduced on pages 97–99 of this *Bulletin*.)
To the Birmingham Chamber of Commerce Annual Banquet on 23 January 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech300.pdf

Inflation and the service sector

(Reproduced on pages 146–57 of this *Bulletin*.)
Speech by Professor Timothy Besley to the Cardiff Breakfast Club on 18 January 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech299.pdf

Inflation and the supply side of the UK economy

(Reproduced on pages 136–45 of this *Bulletin*.)
Speech by Andrew Sentance at Bloomberg City Gate House on 16 January 2007.

www.bankofengland.co.uk/publications/speeches/2007/speech298.pdf

The impact of the recent migration from Eastern Europe on the UK economy

(Reproduced on pages 131–35 of this *Bulletin*.)
Paper by David Blanchflower. A shortened version of this paper was given as a speech at a lunch for members of the Cambridgeshire Chambers of Commerce.

www.bankofengland.co.uk/publications/speeches/2007/speech297.pdf

Through the looking glass: reform of the international institutions

(Reproduced on pages 92–96 of this *Bulletin*.)
Speech by the Governor, Inaugural International Distinguished Lecture to the Melbourne Centre for Financial Studies, Australia on 21 December 2006.

www.bankofengland.co.uk/publications/speeches/2006/speech296.pdf

Pricing for perfection

(Reproduced on pages 112–17 of this *Bulletin*.)
Speech by Sir John Gieve at the Bank of England to a group of market participants on 14 December 2006.

www.bankofengland.co.uk/publications/speeches/2006/speech295.pdf

Roy Bridge Memorial Lecture by Paul Tucker: Macro, asset price, and financial system uncertainties

(Reproduced on pages 122–30 of this *Bulletin*.)
Given on 11 December 2006.

www.bankofengland.co.uk/publications/speeches/2006/speech294.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.

Articles and speeches

Speeches are indicated by (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)

2007 Q1

- The Monetary Policy Committee of the Bank of England: ten years on
- The macroeconomic impact of globalisation: theory and evidence
- The macroeconomic impact of international migration
- Potential employment in the UK economy
- The role of household debt and balance sheets in the monetary transmission mechanism
- Gauging capacity pressures within businesses
- Through the looking glass: reform of the international institutions (S)
- The Governor's speech to the Birmingham Chamber of Commerce Annual Banquet (S)
- Perspectives on current monetary policy (S)
- The MPC comes of age (S)
- Pricing for perfection (S)
- Risks to the commercial property market and financial stability (S)
- Macro, asset price, and financial system uncertainties (S)
- The impact of the recent migration from Eastern Europe on the UK economy (S)
- Inflation and the supply side of the UK economy (S)
- Inflation and the service sector (S)
- Recent developments in the UK labour market (S)

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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:

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Working papers

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

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

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

No. 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)
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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

No. 315 Do announcements of bank acquisitions in emerging markets create value? (December 2006)
Farouk Soussa and Tracy Wheeler

No. 316 Financial infrastructure and corporate governance (December 2006)
Helen Allen, Grigoria Christodoulou and Stephen Millard

No. 317 Corporate debt and financial balance sheet adjustment: a comparison of the United States, the United Kingdom, France and Germany (December 2006)
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No. 318 Does Asia's choice of exchange rate regime affect Europe's exposure to US shocks? (February 2007)
Bojan Markovic and Laura Povoledo

No. 319 Too many to fail — an analysis of time-inconsistency in bank closure policies (February 2007)
Viral Acharya and Tanju Yorulmazer

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.

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.

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.

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

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Financial Stability Report

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

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

Payment Systems Oversight Report

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

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

Handbooks in central banking

The series of *Handbooks in central banking* provide concise, balanced and accessible overviews of key central banking topics. The *Handbooks* have been developed from study materials, research and training carried out by the Bank's Centre for Central Banking Studies (CCBS). The *Handbooks* are therefore targeted primarily at central bankers, but are likely to be of interest to all those interested in the various technical and analytical aspects of central banking. The 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.

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/redbookfeb07.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.

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.

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.

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.

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.

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

26 April
25 October

Quarterly Bulletin, Inflation Report and *Financial Stability Report* subscription details

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

Destination	2007					
	QB, FSR and *IR* package	*QB* and *IR* package	*IR* and *FSR* package	*QB* only	*IR* only	*FSR* only
United Kingdom						
First class/collection[1]	£31.50	£27.00	£13.50	£21.00	£10.50	£5.25
Students/schools (concessionary rate UK only)	*£10.50*	*£9.00*	*£4.50*	*£7.00*	*£3.50*	*£1.75*
Academics (concessionary rate UK only)	*£21.00*	*£18.00*	*£9.00*	*£14.00*	*£7.00*	*£3.50*
Rest of Europe						
Letter service	£38.50	£33.00	£17.00	£25.00	£13.00	£6.50
Outside Europe						
Surface mail	£38.50	£33.00	£17.00	£25.00	£13.00	£6.50
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(1) Subscribers who wish to collect their copy (copies) of the *Bulletin, Inflation Report* and/or *Financial Stability Report* may make arrangements to do so by writing to the address given below. Copies will be available to personal callers at the Bank from 10.30 am on the day of issue and from 8.30 am on the following day.

Readers who wish to become **regular subscribers**, or who wish to purchase single copies, should send to the Bank, at the address given below, the appropriate remittance, payable to the Bank of England, together with full address details, including the name or position of recipients in companies or institutions. If you wish to pay by **Visa, MasterCard, Maestro** or **Delta**, please telephone +44 (0)20 7601 4030. Existing subscribers will be invited to renew their subscriptions automatically. Copies can also be obtained over the counter at the Bank's front entrance.

The **concessionary** rates for the *Quarterly Bulletin*, *Inflation Report* and *Financial Stability Report* are noted above in *italics*. Academics at UK institutions of further and higher education are entitled to a concessionary rate. They should apply on their institution's notepaper, giving details of their current post. **Students and secondary schools** in the United Kingdom are also entitled to a concessionary rate. Requests for concessionary copies should be accompanied by an explanatory letter; students should provide details of their course and the institution at which they are studying.

These publications are available from Publications Group, Bank of England, Threadneedle Street, London, EC2R 8AH; telephone +44 (0)20 7601 4030; fax +44 (0)20 7601 3298; email mapublications@bankofengland.co.uk or fsrenquiries@bankofengland.co.uk.

General enquiries about the Bank of England should be made to +44 (0)20 7601 4878.
The Bank of England's website is at www.bankofengland.co.uk.

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