



Quarterly Bulletin

Autumn 2003

Bank of England

Volume 43 Number 3



Bank of England Quarterly Bulletin

Autumn 2003

Summary	255
Recent economic and financial developments	
Markets and operations Box on issuance of HM Government US dollar bond Box on adjustments to the Bank's official operations in the sterling	257 262
money markets	270
Research and analysis	
Trends in households' aggregate secured debt Box on structure of model	271 272
Public expectations of UK inflation	281
Non-employment and labour availability	291
The information content of regional house prices: can they be used to improve national house price forecasts?	304
Balance sheet adjustment by UK companies	315
Summaries of recent Bank of England working papers Implicit interest rates and corporate balance sheets: an analysis using	
aggregate and disaggregated UK data	327
A Merton-model approach to assessing the default risk of UK public companies	328
Forecasting inflation using labour market indicators	329
UK business investment: long-run elasticities and short-run dynamics	330
E-Darter versus riat money: Will central banks survive?	331
Credit risk diversification, evidence from the eurobond market	332 222
	555

Houblon-Norman essays

Inflation targeting and the fiscal policy regime: the experience	
in Brazil	334
The optimal rate of inflation: an academic perspective	343
Reports	
The EU Financial Services Action Plan: a guide	352
Box on a Single Market in Financial Services: estimating the benefits	353
Box on FSAP measures	356
Box on the Lamfalussy process	359
Box on market experts' views about the FSAP	362

Speeches

Credit conditions and monetary policy

Speech by Paul Tucker, executive director of the Bank of England and member of the Monetary Policy Committee, given to the Leeds Financial Services Initiative on 28 August 2003 366

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Volume 43 Number 3

Quarterly Bulletin—Autumn 2003

Markets and operations (pages 257–70)

Research and analysis (pages 271–333)

This article reviews developments since the Summer *Quarterly Bulletin* in sterling and global financial markets, UK market structure and the Bank's official operations.

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.

Trends in households' aggregate secured debt (by Rob Hamilton of the Bank's Structural Economic Analysis Division). The aggregate level of households' secured debt relative to their income has increased by about a quarter over the past five years, and has almost tripled since 1980. Using a simple model, this article concludes that much of this increase can be accounted for by the spread of homeownership and the fall in inflation (which has reduced the rate at which households' real debt burden is eroded over time). However, the model is unable to account for the full extent of the recent increase in secured borrowing growth. The model also suggests that, because only a relatively small fraction of the housing stock changes hands each year, the aggregate level of debt responds relatively slowly to changes in house prices. So the recent increases in house prices could lead to continuing increases in the debt to income ratio over the next five to ten years.

Public expectations of UK inflation (by Clare Lombardelli and Jumana Saleheen of the Bank's Monetary Assessment and Strategy Division). Every quarter, NOP carries out a survey of the inflation expectations of the general public. This article illustrates how expectations vary according to individuals' different circumstances, and tries to explain how these differences might occur.

Non-employment and labour availability (by Jerry Jones, Michael Joyce and Jonathan Thomas of the Bank's Structural Economic Analysis Division). According to the Labour Force Survey, about 20% (approximately 7.5 million) of the non-student working-age population were not in paid employment in 2002. Of these people about one in five were classified as unemployed, with the remainder labelled as 'inactive'. Despite this categorisation, however, some groups in the so-called inactive population are as likely to move into employment as those classified as unemployed, so any comprehensive measure of labour availability needs to incorporate information on the characteristics of the non-employed pool as a whole. This paper describes the key trends in the demographic and skill structure of the non-employed population since the mid-1980s and contrasts them with those in employment. It also attempts to draw out the implications of these trends for overall labour availability, building on recent Bank research which models individual transition rates from non-employment into employment.

The information content of regional house prices: can they be used to improve

national house price forecasts? (by Rob Wood of the Bank's Structural Economic Analysis Division). It is often suggested that house price movements in the South East lead, or even cause, movements in the rest of the United Kingdom. If this were the case then house price inflation in the South East would be useful when forecasting national house price inflation. There are plausible channels through which such a 'ripple effect' could operate. But tests for patterns of regional price changes consistent with the effect give mixed results. There is evidence that regional price Houblon-Norman essavs

(pages 334-51)

changes were consistent with the South East playing a leading role in the late 1980s/early 1990s, but not during other periods. So it is important to understand the nature of the shock to the housing market before concluding that a given house price change in London and the South East has implications for house prices in other regions.

Balance sheet adjustment by UK companies (by Philip Bunn and Garry Young of the Bank's Domestic Finance Division). Corporate debt levels in the United Kingdom are currently at an historically high level in relation to the market value of corporate capital. Empirical evidence discussed in this article suggests that this is unlikely to be an equilibrium position and that companies will continue to act so as to strengthen their balance sheets. Much of this adjustment is likely to occur through financial channels, such as reduced dividend payments or increased new equity issues, but it could also occur through more restrained capital investment. Illustrative simulations presented in the article suggest that adjustment tends to be gradual and that it may take several years for balance sheets to return to equilibrium.

Inflation targeting and the fiscal policy regime: the experience in Brazil (by Francesco Giavazzi, Houblon-Norman Fellow and Professor of Economics at Bocconi University, Milan and Visiting Professor of Economics at the Massachusetts Institute of Technology). This article reviews the recent experience of Brazil showing that credit risk is at the centre of the mechanism through which a central bank might lose control of inflation. Brazil during 2002 came close to a situation where fiscal policy hindered the effectiveness of monetary policy. But in early 2003 a change in investors' perception of the long-run fiscal stance brought the economy back to normal conditions, reducing credit risk, stabilising the exchange rate and, through these two variables, inflation expectations, inflation and the dynamics of the public debt. Brazil's experience could thus offer useful lessons for other emerging market economies, which consider adopting inflation targeting as their monetary policy rule.

The optimal rate of inflation: an academic perspective (by Peter Sinclair, Houblon-Norman Fellow and Professor of Economics at the University of Birmingham). In an economy free of all imperfections, inflation should be slightly negative. Prices should keep dropping, at the real rate of interest. Any higher rate of sustained inflation (or lower deflation) would reduce the benefits from holding real money. Central banks typically aim for modest positive inflation, however. This article explores five types of imperfection: inertia in nominal prices, the need for distorting taxes, market power for retail banks, the value of the option to cut nominal interest rates in bad times, and menu costs. It concludes that the combined effect of these imperfections is in practice likely to justify a small positive rate of inflation.

Reports (pages 352–65) **The EU Financial Services Action Plan: a guide.** A Single Market in financial services has long been an EU objective. The integration of financial markets in the EU has progressed much further in wholesale than in retail financial services, with the latter still segmented largely along national lines. The Financial Services Action Plan (FSAP) consists of a set of measures intended by 2005 to fill gaps and remove the remaining barriers to a Single Market in financial services across the EU as a whole. This guide to the FSAP has been prepared by HM Treasury, the Financial Services Authority (FSA) and the Bank of England. The guide is intended to provide an introduction to the FSAP for the UK financial sector, corporate sector and consumer groups, where they are not yet sufficiently familiar with its potential impact, rather than for experts. The guide is being published now, because the FSAP is in the process of being implemented and the UK authorities are keen to ensure that the UK financial sector, corporate sector and consumer groups are consulted on, and fully understand the impact of, FSAP measures.

Markets and operations

This article reviews developments since the Summer Quarterly Bulletin in sterling and global financial markets, UK market structure and the Bank's official operations.⁽¹⁾

- Market developments were consistent with expectations of a stronger global economic recovery: bond yields rose sharply, while corporate bond spreads narrowed and equity indices rose.
- US dollar interest rates were particularly volatile, with changes amplified by heavy mortgage hedging activity.
- Sterling appreciated against the euro and depreciated against the US dollar and Japanese yen, leaving the effective rate fairly stable.
- Expectations for further official interest rate reductions in the United Kingdom receded.
- Issuance of new dematerialised money market instruments in the CREST system started on 15 September; the migration of outstanding instruments into CREST began. The Bank issued new notices on eligible debt securities and certificates of deposit in London.

Since the end of May, government bond yields have been highly volatile, and have risen sharply, especially in the United States and Japan, as optimism has grown about the outlook for global economic recovery. Major equity indices have risen and corporate bond spreads narrowed further, consistent with signs of economic recovery or reduced risk premia. The US dollar and Japanese yen appreciated against the euro (Table A).

Table A

Summary of changes in market prices

	30 May	5 Sept.	Change
December 2003 three-month interest rate future (per cent) United Kingdom Euro area United States	3.41 2.02 1.16	3.86 2.19 1.19	45 bp 17 bp 3 bp
Ten-year nominal government forward rate (per cent) (a) United Kingdom Euro area United States	4.71 5.32 5.76	4.97 5.41 6.93	26 bp 9 bp 117 bp
Equity indices FTSE 100 index Euro Stoxx 50 index S&P 500 index	4048 2330 964	4257 2615 1021	5.2% 12.2% 6.0%
Exchange rates Sterling effective exchange rate \$/€ exchange rate ¥/€ exchange rate	97.8 1.18 141	99.1 1.10 129	1.3% -6.2% -8.4%
Sources: Bank of England and Bloomberg			

(a) Six-month forward rates, derived from the Bank's government liability curve. Estimates of the UK curve are published daily on the Bank of England's web site at www.bankofengland.co.uk/statistics/yieldcurve/main.htm. The rise in US bond yields triggered large-scale mortgage-hedging activity, which reinforced, or exaggerated, the rise in US dollar yields.

Expectations for economic recovery

Over the period, Consensus economic growth forecasts for 2004 were revised upwards a little for the United States, Japan and the United Kingdom, but despite recent improvements in some forward-looking confidence measures, euro-area forecasts were generally revised downwards (Chart 1).

US, UK and euro-area nominal forward rates, all of which had continued to fall in early June, subsequently rose, and continued to increase through July and much of August. Changes were more pronounced for US nominal forward rates (Chart 2) and, over the period as a whole, these showed the largest increase (Chart 3).

Rise in US bond yields

That the fall and rise in US dollar nominal forward rates far exceeded those for euro and sterling interest rates is, perhaps, unsurprising. Market participants suggested

(1) The period under review is from 30 May (the data cut-off for the previous Bank of England Quarterly Bulletin) to 5 September.

Chart 1 Expected 2004 real GDP growth



Chart 2

Six-month UK, US and German rates seven years forward^(a)



that some of the decline in interest rates in early June reflected speculation that the Federal Reserve might purchase US Treasury bonds in so-called 'unconventional' monetary policy measures, in order to inject reserves were the zero nominal interest rate bound reached. These trades started to be unwound as economic data were interpreted as suggesting stronger signs of economic recovery in the United States than had been expected previously. There was more selling after the FOMC announcement on 25 June and Chairman Greenspan's testimony on 15 July, interpreted as further reducing the probability of unconventional

Chart 3 Changes in implied nominal forward rates(a)



monetary policy steps. But contacts also attributed some of the difference in US dollar, euro and sterling interest rates to the effects of hedging in the US mortgage market.

In the United States, many mortgage loans are packaged up into 'mortgage-backed securities' (MBS), a significant proportion of which are held by government sponsored enterprises (GSEs) including Fannie Mae (FNMA) and Freddie Mac (FHLMC).⁽¹⁾ Holders of these assets receive the cash flows from the underlying mortgages, most of which are lent at fixed rates of interest. But borrowers also have the right to repay their mortgages before the due date. When this happens, holders of MBS receive the early repayment, but their exposure to interest rate risk—the 'duration'⁽²⁾ of their assets—decreases. If their liabilities are principally non-callable, such that their duration falls only steadily towards redemption, holders of MBS will face a 'duration gap'.⁽³⁾

To hedge this risk, individual MBS holders may be able to issue callable bonds or enter into swaption transactions, a 'static' hedge. But because the US household sector is a very large net holder of the prepayment option, the financial system is unable, in aggregate, to hedge this risk completely—there is insufficient demand for callable bonds and insufficient supply of swaptions.⁽⁴⁾ Alternatively, to manage their

For information about GSEs, see Box 5 of the Bank of England Financial Stability Review, June 2000, pages 54–55.
 Duration (or 'modified duration') captures the sensitivity of the value of the asset with respect to the interest rate—it is a measure of interest rate risk.

(3) Mortgage servicers, who either originate mortgages themselves or buy the servicing rights from other originators, face a different type of risk. They collect mortgage payments in return for a service fee, an income flow that is highly sensitive to remortgaging. They tend to manage this risk by holding 'principal-only' strips of MBS.

(4) Swaptions are options on forward-looking interest rate swaps. A swaption gives the buyer the right (but not the obligation) to enter into an interest rate swap at a specific date in the future, at a particular fixed rate and for a specified term. Market contacts also reported that other investors, such as some US commercial banks, chose to adjust their interest rate risk exposure by selling MBS. The yield spread over US Treasuries of the current coupon 30-year FNMA MBS rate also widened sharply in late July/early August. Large US banks had increased their holdings of MBS in recent years, potentially exposing them to greater prepayment risk. See *Bank of England Financial Stability Review*, June 2002, page 34.

interest rate risk, individual MBS holders may attempt to shift the duration of other elements in their balance sheet when the prospective duration of their MBS holdings changes—this is referred to as 'dynamic' hedging. For example, to offset falls in the duration of MBS assets, investors will tend to acquire additional exposure to long-term rates by buying Treasury bonds or receiving the fixed leg in interest rate swaps. This additional demand for bonds or for the fixed side of swaps will in itself tend to raise their prices—and lower medium to long-term yields—at least temporarily.

The probability of remortgaging activity depends on the relationship between current mortgage rates and the interest rates on existing mortgages. Interest rates on existing mortgages will reflect earlier episodes of remortgaging (Chart 4). If current mortgage rates are far away from these levels, changes in current mortgage rates will not make much difference to the probability of remortgaging. But as current rates fall towards and then reach or fall below the levels at which previous refinancing took place, the probability of remortgaging rises rapidly, and so too will dynamic hedging activity which, as described above, will tend to drive long interest rates down further. Similarly, as mortgage rates rise towards the rates being paid on existing mortgages, the probability of early redemption can fall rapidly, leading investors to sell US Treasury bonds, or pay fixed in swaps, which in itself will temporarily push yields even higher. So mortgage-hedging activity can amplify yield movements arising for other reasons, but will not always do so.

Chart 4 Distribution of FNMA and FHLMC mortgage rates



Between mid-June and mid-August, the benchmark ten-year US Treasury yield increased from 3.11% to 4.56%. At the same time, the 30-year mortgage rate rose from 4.99% to 6.22%. On some estimates, this rise reduced the proportion of mortgages that could be refinanced profitably from around 90% in June to under 20% in early September (Chart 5). Contacts said that mortgage hedging was partly responsible for the rise in yields, reinforcing the rise driven by improved expectations of the economic outlook and adjusted perceptions of the prospects for unconventional monetary policy measures.

Chart 5

Estimated refinancing risk profile for FNMA MBS



Source: Merrill Lynch.

US dollar swap rates also rose sharply—the increase in the ten-year rate in July (114 basis points) was the largest monthly change since at least 1988. The spread between US dollar swaps and US Treasury yields temporarily widened (Chart 6), indicating that a larger amount of hedging activity took place in the swap market than in the Treasury market.⁽¹⁾ By early September, the ten-year spread had returned to March levels.

The shift towards hedging in swaps over recent years, and the increase in swap market liquidity, in part reflected the falling supply of US Treasury marketable debt between 1997 and 2000 when there were federal budget surpluses in the United States.

Rising government debt has become an increasing element of the domestic counterpart to the US external deficit. Since the decline in equity markets from their peaks in 2000, the external deficit has been largely financed by overseas purchases of US Treasury bonds

(1) Unlike, for example, in February 1994. For a discussion of that period of intense mortgage hedging activity, see Fernald, J D, Keane, F and Mosser, P C, 'Mortgage security hedging and the yield curve', *Federal Reserve Bank of New York Quarterly Review*, Summer-Fall 1994.

Chart 6 Ten-year US dollar swap spread



and US Agency debt, especially in Asia, where foreign exchange reserves have accumulated.⁽¹⁾ Given increased US Treasury debt issuance, US dollar swap spreads might have narrowed further had there not been heavy demand for highly rated US dollar denominated fixed income. A combination of these factors affected financial conditions and, for example, featured in the UK government's decision to issue US dollar-denominated debt in June (see the box on pages 262–63).

The Japanese government bond (JGB) market was also driven by distinctive factors over the period. Japanese yen interest rates (Chart 7) rose in two main phases: in June, on tentative signs of economic recovery, and in August, following much stronger-than-expected Q2 GDP data (Chart 8). While market participants noted technical factors at times—such as selling of JGBs by Japanese banks as the rise in yields increased 'value at risk' exposures, with the effect of extending moves further—these phases were also reflected in the Japanese equity market, which rose sharply over the period. That might point to increased expectations of economic recovery in Japan.

Increased volatility in Japanese bond yields brought some increase in yen swaption volatilities (Chart 9). It is perhaps surprising that they had fallen to such low levels in recent years, given the amount of uncertainty that exists about medium to long-run Japanese inflation.

Short-term interest rates

As in the bond market, short-term interest rates (STIR) implied by the futures market also fell and then rose, ending the period substantially higher, at least at

See Bank of England Financial Stability Review, June 2003, pages 48–49.
 See Bank of England Financial Stability Review, June 2003, page 11.

Chart 7 Japanese government yield curve



Chart 8 Ten-year Japanese government bond yield and Nikkei 225 index



maturities two years ahead (Chart 10). The turnaround in implied rates in June and July was similarly dramatic (Chart 11). Some speculative players were said to have had large positions borrowing short term and investing or lending at longer maturities, in a 'search for yield'.⁽²⁾ With the rise in yields, contacts reported that many of these positions were closed out, triggering stop-loss limits and perhaps selling, extending the upward movement in short-term interest rates.

Interestingly, open interest in short sterling futures (the number of contracts outstanding) grew slightly in late July and early August as new positions were put on. This was in marked contrast to March 2003, when a sharp rise in near-term short sterling rates was accompanied by a sudden fall in open interest in a somewhat disorderly liquidation of long speculative positions that had been built up prior to the Iraq war.

Chart 9 Option-implied volatility of three-month into ten-year swaptions



Sources: Bloomberg and Merrill Lynch.

Chart 10 Changes in short-term interest rate expectations^(a)



(a) As implied by short-term interest rate futures contracts.

Chart 11 Three-month interest rates implied by December 2004 STIR futures^(a)



(a) As implied by short-term interest rate futures contracts.

(1) Quoted level of implied volatility multiplied by the underlying interest rate.

The sharp rise in sterling short-term interest rates, particularly on 31 July and 1 August, was initially viewed as a spillover effect from US dollar markets, but these movements have not unwound. Rather, contacts report a marked change in view, with most market participants now not expecting the Bank's Monetary Policy Committee (MPC) to reduce the repo rate below its current level (Chart 12). The MPC reduced the repo rate by 0.25 percentage points to 3.5% on 10 July. Most economists and market contacts expect that rate to hold at least until end-2003. The difference between market rates and the average of economists' central forecasts for end-2004 is large, however. As of 26-28 August, the average surveyed forecast of the Bank repo rate was 3.87%, while the December 2004 short sterling contract implied a three-month cash rate of 4.74%. That difference could reflect an increased risk or term premium in short sterling futures contracts.

Chart 12 UK rate expectations from short sterling futures and surveys of economists



Sources: Bloomberg and Reuters.

The market's uncertainty about the outlook for interest rates may be reflected in measures of implied volatility from interest rate options contracts. But care is needed over the units in which volatility is measured. Implied volatility itself is quoted as a percentage of the underlying interest rate. On this basis, uncertainty in the United Kingdom has for some time been comparable to that in the euro area but considerably lower than in the United States (see Chart 13). This is potentially misleading, however, as the level of interest rates is higher in the United Kingdom. If implied volatility is measured in terms of basis points,⁽¹⁾ then it is rather

Issuance of HM Government US dollar bond

On 23 June, on behalf of HM Treasury (HMT), the Bank of England launched the issue by the UK government of a \$3 billion $2^{1}/_{4}$ % 5-year eurobond. This was the first UK government dollar-denominated bond since 1996, and its first foreign currency issue since 2000. The issue was undertaken as part of the ongoing refinancing of the United Kingdom's foreign exchange reserves, and was brought to take advantage of market conditions that made it a cheaper form of financing the reserves than sterling issuance via gilts. Although sterling debt management was transferred to the Debt Management Office in 1998, the Bank has remained the government's agent for foreign currency debt, as it is used to finance the United Kingdom's foreign exchange reserves, which are managed by the Bank on behalf of HMT.

The issue was announced by the lead managers and joint book-runners-Citigroup, Deutsche Bank, Goldman Sachs and Morgan Stanley-early in Asian trading on 23 June. It was formally launched at 10 am in London, and the order book closed in the early afternoon. The bond was priced later that day at a spread of just 2 basis points over the yield on the 5-year US Treasury benchmark. Adjusting for the difference in maturity dates between the UK bond and the US Treasury benchmark, this represented a spread more than 3 basis points below the Treasury curve. That compared with a spread above the benchmark Treasury of 5 basis points (equivalent to 4.8 basis points on a curve-adjusted basis) for the United Kingdom's previous dollar issue, the $2 \text{ billion } 6^{3}/4\%$ 5-year eurobond in July 1996.

The Bank and HMT keep options for financing the reserves under review, comparing the relative value for money of gilt and foreign currency borrowing. The policy is set out each year in HMT's *Debt and Reserves Management Report* (DRMR). The DRMR for 2003–04, published on 9 April 2003, stated that:

'For 2003–04, foreign currency borrowing continues to be an option for financing the reserves. The UK's last dollar borrowing was in 1996 and the last euro borrowing in 2000. As then, the Bank of England would manage the issuance of the foreign currency liability, under the authorisation of HM Treasury. The justification for renewed foreign currency borrowing would be to obtain better value-for-money, compared with the cost of financing through gilts, on an equivalent currency-swapped basis.'⁽¹⁾

In assessing the value-for-money of a potential dollar issue, the Bank and HMT compared estimates of the cost of a dollar issue swapped into floating-rate dollars, against the cost of issuing a gilt of equivalent maturity currency swapped into floating-rate dollars (via a sterling fixed-for-floating interest rate swap and a cross-currency basis swap). In theory, funding arbitrage should ensure that there is no difference between the common-currency costs to the United Kingdom of issuing debt denominated in sterling or in dollars.⁽²⁾ In practice, however, borrowers sometimes find that they are able to borrow at a lower cost by issuing debt in a particular currency. Among the ways in which this type of arbitrage has been seen to occur are cases in which the issuer is better-known to investors in one market than another. or if there is especially strong demand by investors for assets denominated in a particular currency. In general, funding arbitrage of this sort is most likely to be experienced by large and well-known issuers, such as sovereigns, supranationals, and multinational corporations.

It followed from this that there were three issues for the Bank and HMT to weigh when considering a potential dollar issue. First, there was the currency-swapped cost of gilt issuance in terms of floating-rate \$ Libor. Second, the level of US swap spreads, one measure of which is a US Treasury benchmark bond swapped into floating-rate \$ Libor. And third, an estimate of the expected spread over the Treasury benchmark bond of the prospective UK dollar bond.

Chart A shows UK and US 5-year swap spreads from 1997 to date. US swap spreads rose in 1999, and remained wide in the first half of 2000, both in absolute terms and relative to other markets (on a currency-adjusted basis). In large part this appears to have reflected expectations of a continuing improvement in the US fiscal position and of net repayments of US government debt. Swap spreads

(1) Page 29 of the DRMR, available on the United Kingdom Debt Management Office web site, www.dmo.gov.uk/remit/f1remit.htm.

(2) See, for example, the box 'International funding arbitrage', Bank of England Quarterly Bulletin, May 2000, pages 130-31.

Chart A

Five-year sterling and US dollar swap spreads



Source: Bloomberg

subsequently edged lower in both the United States and the United Kingdom, as expectations grew that the slowdown in global activity would result in higher supply of government debt. The recent opportunity for the UK government to issue a dollar-denominated bond at a lower cost than gilt financing was facilitated in part by the widening differential between UK and US swap spreads that re-emerged in early 2003. As the chart shows, however, there had been periods in the past few years when the differential had been at least as wide as in the most

Chart 13

Non-normalised six-month option-implied volatility of short-term interest rates



Sources: Bank of England, CME, Eurex and LIFFE

higher for sterling interest rates than for dollar or euro rates (see Chart 14). But the level of sterling implied volatility is close to its average since 1997.

Spreads and equities

The rise in bond yields was partly reflected in higher investment-grade corporate bond yields; non-investment grade yields were stable or lower. Credit spreads fell

recent period. However, the third element of the value-for-money consideration, the expected spread of a UK government dollar bond over the comparable US Treasury benchmark, was judged to be less favourable in that period. As part of its routine liaison with the market, the Bank receives regular advice from investment banks on the expected spread. Estimates of the spread were based in large part on the spreads over US Treasuries of other high-grade bonds in the sovereigns, supranationals and agencies sector—including, until its maturity, the 1996 UK dollar bond. These spreads generally widened in the period when US swap spreads were widening, and gradually narrowed in subsequent years as swap spreads declined.

Within this framework for considering value for money and of broad market developments, the Bank monitored shorter-run market conditions to see if a favourable opportunity to issue could be identified. In recent months, this suggested that there was considerable interest for high-quality fixed-rate dollar exposure, and that this demand was moving along the maturity spectrum as the yield curve flattened and investors were 'searching for yield'. It was against this background that the UK government decided to launch the issue on 23 June.

Chart 14

Normalised six-month option-implied volatility of short-term interest rates



Sources: Bank of England, CME, Eurex and LIFFE.

over the period (Chart 15), suggesting that-despite some increases in the cost of capital-perceptions about corporate risk improved, consistent with perceptions of a stronger economic outlook. Declines were broad-based, across industry groups.

Equity indices rose over the period, most notably in Japan (Chart 16). Other things being equal, higher interest rates associated with improved prospects for

Chart 15 Spreads over swaps of international investment and sub investment-grade corporate bonds



Source: Merrill Lynch

Chart 16 Selected equity indices



Source: Bloomberg

economic growth might have been expected to lead to falls in equity values as future dividends are discounted at higher rates. That equity indices rose might therefore also be consistent with expectations of greater corporate profitability, reflected in future dividend growth or reduced risk premia. Second-quarter US earnings were generally above market estimates.

In the United Kingdom, the increase in

small-capitalisation equity indices has been greater than for the larger FTSE 100 index (Chart 17). A number of factors might have contributed to this difference. First, the FTSE 100 and 250 indices have a different sectoral composition—for example there is a larger IT component in the FTSE 250, and sectoral IT sub-indices have increased strongly globally. However, the IT sectors are relatively small. Second, the FTSE 250 index has a greater proportion of constituent companies

Chart 17 FTSE 100 and 250 indices



regarded as having cyclical earnings than the FTSE 100, so might be expected to see greater fluctuations over the business cycle. The larger rise in the FTSE 250 would therefore be consistent with upwardly revised expectations to economic growth. And third, the difference may be driven by a greater reduction in the risk premium demanded for holding smaller-capitalisation stocks than FTSE 100 stocks.

Exchange rates

Major exchange rates have been stable in effective terms relative to the sharp movement in global bond yields (Chart 18). However, there were larger moves in bilateral exchange rates: the US dollar and Japanese yen appreciated against the euro by around 7% and 9%, respectively, consistent with market anecdote of a renewed focus on relative growth expectations.

Chart 18 Effective exchange rates



Some market participants also note that previous US dollar depreciation had been concentrated against only

a limited number of currencies—including sterling and the euro—because dealers seeking to short the US dollar could not take that position effectively against currencies that were pegged to the US dollar or where there was significant central bank intervention. Data from the Chicago Mercantile Exchange suggest that the more recent US dollar appreciation against the euro has been accompanied by a reduction in speculative net long euro-US dollar positions. So fluctuations in the US dollar-euro exchange rate may have been amplified by fixed pegs elsewhere, leaving the effective US dollar exchange rate index relatively stable.

The sterling ERI rose by 1.3% over the period as a whole (Chart 19), with sterling appreciation against the euro largely offset by depreciation against the US dollar. Implied volatilities remained low for sterling and other currency pairs, notwithstanding macroeconomic uncertainty. One-year implied euro-sterling and dollar-sterling correlations fell slightly over the period as a whole (Chart 20).

Chart 19 Sterling effective exchange rate



Table B decomposes exchange rate movements according to the uncovered interest parity (UIP) condition, which seeks to assess the impact of interest rate news on the exchange rate.⁽¹⁾ Interest rate news here is measured as the change in the differences between ten-year UK and overseas government bond yields. Assuming constant medium-term exchange rate expectations and exchange rate risk premia, a fall in relative UK interest rates would be expected to lead to an immediate depreciation in sterling's exchange rate followed by a gradual

Chart 20





Table B Exchange rate movements and news: 30 May-5 September

	£ ERI	€/£	<u>\$/£</u>	\$/€
Actual change				
(per cent)	1.39	3.16	-3.21	-6.17
Interest rate news				
(percentage points)	-0.17	0.78	-4.78	-5.57
of which: domestic	4.34	4.34	4.34	3.56
foreign	-4.52	-3.56	-9.13	-9.13

appreciation. The direction of sterling's exchange rate against the euro and US dollar was consistent with relative interest rate news, though the magnitude of these changes was not.

In June and July, sterling appeared to move independently of the euro and US dollar rate. Market contacts reported that this in part reflected 'carry trades' that were put on in June but taken off in July, after the MPC reduced the Bank's repo rate.⁽²⁾

Developments in market structure

This section provides an update of some significant changes in market infrastructure, as well as developments in sterling instruments and trading patterns.

Continuous Linked Settlement

Both the volume and value of foreign exchange transactions settling through Continuous Linked Settlement (CLS) have risen for most of the twelve months of its operation (Chart 21).⁽³⁾

⁽¹⁾ See Brigden, A, Martin, B and Salmon, C (1997), 'Decomposing exchange rate movements according to the uncovered interest rate parity condition', *Bank of England Quarterly Bulletin*, November, pages 377–89.

⁽²⁾ Carry trades involve borrowing in one currency and investing in a higher-yielding one with the aim of earning the interest rate difference. For a description of carry trades, see 'Markets and operations', Bank of England Quarterly Bulletin, Summer 2003, page 156.

⁽³⁾ CLS, operated by CLS Bank International, was launched on 9 September 2002. See Bank of England Quarterly Bulletin, Autumn 2002 (pages 257–58) and Winter 2002 (pages 365–66) and the Bank of England Financial Stability Review, December 2002 (pages 82–85).

Chart 21 Daily settlement volumes and values in CLS(a)



(a) Monthly averages.

(b) Each trade consists of two sides.

Its activities continue to expand. Four new currencies were introduced on 8 September: the Danish krone, Norwegian krone, Swedish krona and Singapore dollar. Settlement of the New Zealand dollar, Hong Kong dollar and Korean won, and an extension of settlement to fund managers' foreign exchange trades is expected to begin in 2004.

While CLS has brought major benefits through a reduction in settlement risk, its introduction was closely monitored by market participants in case it affected money markets liquidity. On the one hand, CLS settlement members' ability to fund their gross obligations on a net basis was expected to reduce settlement flows in CLS currencies and improve liquidity. But on the other hand, the need to make payments on a strict timetable might potentially have complicated treasurers' intraday cash management.

In fact, in most CLS currencies neither effect has been observable. For example, analysis by the Bank suggests that there has been little impact on the flows through CHAPS Sterling.⁽¹⁾ There are several possible explanations.

- Before CLS was launched, many CLS settlement members were members of bilateral netting systems, such as FXNet. The impact on gross flows of a shift from bilateral to multilateral netting may have been less marked than expected.
- There may have been a general increase in the volume and value of FX trading in both CLS and non-CLS currencies.

- CLS has introduced a new element of tiering—and hence perhaps additional payment legs—into FX settlement, with CLS settlement members providing settlement services to third-party users.
- Not all settlement members are yet using CLS settlement for all their branches.

Nor has there been any appreciable impact on the euro and US dollar high-value payment systems. Interestingly, though, there has been a material reduction in values and volumes in the Japanese Foreign Exchange Yen Clearing System, a system dedicated to clearing yen payments arising from cross-border transactions. It is not clear why CLS's impact on yen flows should apparently differ from its impact on other currencies.

CLS has not had any obvious detrimental effect on banks' intraday sterling cash management. There has been little or no increase in collateral posted to raise intraday liquidity in CHAPS Sterling since CLS's introduction, and disruptions to CLS arising from late or failed pay-ins have been rare.

Settlement of money market instruments

Work to dematerialise money market instruments, which will reduce settlement risk in sterling money markets by allowing securities to be settled on the basis of delivery-versus-payment in central bank money, is nearing completion. This follows several years' preparation by market participants, CRESTCo and the Bank of England and the necessary legislative amendments.

On 15 September, the Central Moneymarkets Office (CMO) lodging counter closed to new issues of money market instruments (MMIs) such as certificates of deposit (CDs), Treasury bills and bankers' acceptances. At the same time, issuance of equivalent securities, electronic debt securities (EDS), into CREST began. The process of migrating outstanding MMIs from CMO to CREST started with the transfer of euro-denominated securities on 22 September, and will continue with Treasury bills beginning to be transferred on 29 September, bankers' acceptances on 6 October and certificates of deposit (CDs) on 13 October.

Issuers and holders have also been able to 'move' instruments into CREST ahead of migration dates since 15 September through the early maturity of instruments

See the box 'Assessing the impact of CLS on CHAPS Sterling', Bank of England Financial Stability Review, June 2003, pages 81–82.

held in CMO with issuance of equivalent securities in CREST.

Holders, issuers, intermediaries, issuing and paying agents and settlement banks should be fully prepared for these migration processes. The Bank has issued a brief note on preparations agreed between market practitioners for the migration of CDs.⁽¹⁾ Market participants with any questions on migration issues should approach their issuing and paying agents or CRESTCo.

Following the closure of the full CMO transfer service, the Bank will no longer take as collateral in its sterling money market operations any remaining physical money market securities.⁽²⁾

New eligible bankers' acceptance and CD notices

Reflecting the introduction of EDSs in CREST, the Bank issued on 27 August a new notice for eligible bankers' acceptances (the non-material equivalents of eligible bank bills) and a new notice on limit calculations for eligible banks; on 9 September the Bank issued an updated list of eligible banks.⁽³⁾

The Bank also issued on 29 August, on behalf of the Sterling Money Markets Liaison Group, a new notice on issues of certificates of deposit in London,⁽⁴⁾ replacing the Bank of England Notice of 1 November 1996.

A 'London CD' will now be issued with a minimum denomination (or Minimum Transfer Amount in the case of EDSs) of £100,000 or its foreign currency equivalent. Above this minimum amount, CDs issued as EDSs may be transferred in units of one penny or any higher unit value specified by the issuer. This is in line with the International Primary Market Association/International Paying Agents Association conventions on sterling/euro certificates of deposit/euro commercial paper issuance.

The new notices should be read in conjunction with the publication 'Preparing for the dematerialisation of MMIs' by the British Bankers' Association of 29 August.⁽⁵⁾

Developments in major UK banks' wholesale funding

The major UK banks have issued larger amounts of CDs in recent years as their domestic loan books have grown more rapidly than retail deposits.⁽⁶⁾ They have also made greater use of sterling bond issuance and asset securitisation and, increasingly, foreign currency debt issuance with proceeds converted into sterling via the foreign exchange swap market.

Much of this foreign currency debt issuance has been in the money markets. Table C shows the growth in net borrowing by the major UK banks in foreign currency money markets between December 1998 and June 2003, split into debt issuance, borrowing from other banks and borrowing via local offices.⁽⁷⁾ The greater increase in borrowing has been in currencies other than euro, primarily US dollar. Contacts have confirmed that several UK banks have increased considerably their issuance of US dollar certificates of deposit and commercial paper and their borrowing in the US dollar interbank markets. They have been taking advantage of the depth of these markets and the attractiveness to US money market investors of diversifying their credit risk by lending to highly rated, overseas banks.

Table C

Major British Banking Groups' net borrowing in foreign currency money markets(a)

£ billions	Dec. 1998	Jun. 2003	of which:	
			€	Other
CDs and CP issued net of held	12.0	49.4	7.2	42.2
Net from overseas offices (b)	-3.9	9.8	-14.0	23.7
Net from other overseas banks (b)(c)	6.1	32.9	11.3	21.6
Total	14.2	92.1	4.5	87.5

(a) From banks' unconsolidated returns. Only includes banking groups which were members of MBBG throughout. For details of the composition of the MBBG, see the British Bankers' Association web site, www.bba.org.uk. Positive numbers indicate net borrowing.

(b) Deposits and repos net of loans and reverse repos.(c) Other than central monetary institutions and non-resident offices of the reporting institution

In order to convert short-term US dollar liabilities to sterling, banks sell US dollars for sterling in the spot foreign exchange market with a simultaneous forward purchase of US dollars for sterling. These foreign exchange swaps might typically mature at the same time as the bank's underlying US dollar money market liability. Chart 22 shows the flows involved in such a transaction.

⁽¹⁾ See www.bankofengland.co.uk/markets/money/cdsmigration.pdf. (2) For the Bank's notice on transition arrangements, see www.bankofengland.co.uk/markets/money/transnotice030911.pdf.

⁽³⁾ See www.bankofengland.co.uk/markets/money/eliglist.pdf.

⁽⁴⁾ See www.bankofengland.co.uk/markets/money/cdnot001.pdf.
(5) See www.bba.org.uk/pdf/144289.pdf.

⁽⁶⁾ Between December 1998 and June 2003, major UK banks' domestic sterling loans to non-banks increased by over 55%; non-bank domestic sterling liabilities increased by around 35%.

⁽⁷⁾ In fact, banks' overseas offices may raise only part of their funds from money markets, but it is not possible to isolate this in the data.

Chart 22 Stylised foreign exchange swap to convert US dollar liability^(a)



(a) Amounts returned in (3) reflect interest rate differential. It is possible to structure the transaction so that the dollar payments net off exactly. The sterling payments are adjusted accordingly.

Chart 23 Stylised cross-currency interest rate swap to convert US dollar liability^(a)



(a) The bank might ensure that net US dollar flows sum to zero, leaving it with a sterling exposure only. There are many ways to structure the transaction.

Where banks issue longer-maturity foreign currency debt, they may also convert the proceeds to sterling using the foreign exchange swap market, requiring them to roll over the swaps periodically. Alternatively, they might enter into longer-term swaps, including basis swaps in which floating-rate sterling payments are exchanged for floating-rate payments in the foreign currency (Chart 23).

Using overseas money markets diversifies UK banks' sources of wholesale funding and is said to have lowered funding costs. To the extent that it becomes a permanent element of their funding the banks are reliant on continuous liquidity in the foreign exchange swap markets.

Private finance initiative-related inflation-indexed bond issuance

In addition, sterling market contacts have reported significant growth in recent years in the issuance of inflation-indexed bonds by borrowers other than the UK government. A large part of this increase has been due to bonds issued to finance projects under the Private Finance Initiative (PFI), typically for the construction and maintenance of new buildings (such as hospitals) or transport infrastructure (Chart 24). These projects often issue inflation-indexed debt because the future revenue stream from the sponsoring government body (for example, National Health Service trusts or government departments) to the project company is linked to the retail prices index.

Chart 24 Issuance of inflation-indexed non-gilt sterling



Sources: Bank of England, Dealogic, MBIA Insurance Corporation and Royal Bank of Scotland.

(a) July and August only.

Typically, equity investors in the project company cover about 10% of the project costs, with the remainder raised as debt. The company sub-contracts construction and facilities management, but does retain some specific project risks, such as contractor failure, insurance costs and some maintenance and operating cost overruns. Finance may be provided by banks or through the bond market, with smaller or shorter-term deals more likely to be bank-financed.

Recently, many bonds have featured a financial guarantee 'wrap' provided by a monoline insurer so that they are AAA-rated.⁽¹⁾ The monolines also take on project risk, reviewing the structure of underlying

(1) Known as 'monolines' because they specialise in credit insurance. See Rule, D, 'Risk transfer between banks, insurance companies and capital markets: an overview', Bank of England Financial Stability Review, December 2001, page 148. contracts and taking action if projects do not meet performance criteria. Large investors in sterling non-government inflation-indexed debt may, therefore, accumulate concentrations of exposure to the monolines, but with any exposure limited to the difference between the value of the wrapped bonds and the underlying claims on the PFI project companies. UK pension funds are thought to be the largest investors in sterling inflation-indexed bonds in order to match pension liabilities indexed to the retail prices index.

Bank of England official operations

Changes in the Bank of England balance sheet

Table D summarises changes in the components of the Bank's balance sheet between 28 May and 3 September. These were largely driven by increases in customer deposits in both sterling and foreign currencies.

The Bank maintained the nominal value of its three-month and six-month euro-denominated bills outstanding at €3.6 billion by rolling over bills at maturity. The average issuance spread for three-month bills was 11.2 basis points below euribor, compared with 12.9 basis points in the previous period (March-May); and for six-month bills was 14.4 basis points below euribor, compared with 15.3 basis points in the previous period. These slightly narrower spreads might reflect weaker demand for euro-denominated government bills following the reduction in the ECB's official interest rate on 5 June.

Currency in circulation was broadly unchanged over the period as a whole. Within the period, the size of note issuance followed normal seasonal patterns, declining in June as the effects of the May Bank Holiday unwound, but picking up in the run-up to the August Bank Holiday. These patterns are easier to predict than at Easter and Christmas. Consequently, the Bank did not consider uncertainty in the notes forecast sufficient to warrant an increase in the amount of the banking system's liquidity need held over from the 9.45 to the

14.30 rounds of open market operations (the cushion against intraday downward revisions to the forecast shortage).

But also within the period, the change in the stock of refinancing at times exceeded the change in notes in circulation (Chart 25). This largely reflected transactions arranged by the Bank to increase the size of the banking system's liquidity shortage on particular days, in the light of behaviour of short-dated interest rates relative to the official repo rate. The size of the banking system's daily liquidity shortage therefore increased in August, though this also reflected in part greater recourse to the Bank's overnight lending facilities (Chart 26).

Chart 25

Bank notes in circulation, the stock of refinancing and 'Ways and Means'(a)



An illiquid advance to HM Government held constant since the transfer of the responsibility for UK central government cash management to the UK Debt Management Office in April 2000.

Gilts continued to constitute the largest part of the collateral against which the Bank's monetary operations are secured (Chart 27).

The Bank announced a number of minor adjustments to its operations in the sterling money markets during the period (see the box on page 270).

Table D

Simplified version of Bank of England consolidated balance sheet(a)

£ billions

Liabilities	3 Sept.	28 May	Assets	3 Sept.	28 May
Bank note issue	33	33	Stock of refinancing	23	21
Settlement bank balances	< 0.1	< 0.1	Ways and Means advance	13	13
Other sterling deposits, cash ratio deposits and the Bank of England's capital and res	erves 7	5	Other sterling-denominated assets	4	3
Foreign currency denominated liabilities	12	11	Foreign currency denominated assets	12	11
Total (b)	52	49	Total (b)	52	49

(a) Based on published weekly Bank Returns

(b) Figures may not sum to totals due to rounding

Adjustments to the Bank's official operations in the sterling money markets

Following consultation with market participants, the Bank announced on 27 August a number of adjustments to its operations in the sterling money market, which took effect on 15 September. The Bank:

- Put in place transition arrangements to end the eligibility of bills accepted by one bank but drawn by another. Such bills did not exist on any scale before the Bank lifted its requirements on bill clausing in March 2000 for use in the Bank's official operations and in RTGS. The Bank prefers to provide liquidity to the banking sector against the collateral of high-quality claims outside the banking sector.
- Ceased providing collateral against its overnight deposit facility. In practice, collateralisation had

(1) See www.bankofengland.co.uk/markets/money/publications.htm.

Chart 26 Maturity of stock of refinancing and size of daily shortage^(a)



(a) Monthly averages.

Forecasting the liquidity shortage

The accuracy of the Bank's liquidity forecast has been largely in line with that in previous months, but there was a deterioration in late July (Table E). This largely related to problems with the introduction by the Bank of new processes and a new IT system to support its banking operations. There were some delays in the transfer and reporting of some large-value payments between the Bank and the CHAPS system—which affected the Bank's banking and public sector customers. The Bank's open market operations and sterling money market conditions were unaffected. led to offers of deposits motivated by a desire to borrow gilt collateral rather than to deposit cash. That was not the intended purpose of the facility.

- For non-sterling denominated eligible collateral, moved the valuation time from 9 am the same day to 4 pm the previous day and increased the foreign exchange component of the initial margin from 2% to 3%.
- Introduced daily publication of the maturity dates of bills purchased outright in the Bank's official sterling market operations.

Further details, including transition arrangements for bank-on-bank bills and the Bank's revised Operational Notice, are available on the Bank's web site.⁽¹⁾

Chart 27





Table E Intraday forecasts versus actual shortages

Mean absolute difference (standard deviation), £ millions

	9.45 forecast	14.30 forecast	16.20 forecast
2000 (a)	121 (96)	99 (64)	103 (56)
2001 2002	98 (205) 83 (107)	$56 (51) \\ 43 (82)$	30 (73) 30 (73)
2003 Q1	80 (73)	46 (54)	33 (29)
Apr. 2003 May 2003	$167 (183) \\ 114 (119)$	$68 (119) \\ 46 (37)$	39 (51) 46 (43)
June 2003	84 (56)	51 (51)	30 (35)
July 2003 Aug. 2003	$143 (261) \\ 104 (69)$	$ \begin{array}{ccc} 126 & (237) \\ 61 & (44) \end{array} $	$ \begin{array}{cccc} 111 & (238) \\ 66 & (50) \end{array} $

(a) From April 2000

Trends in households' aggregate secured debt

By Rob Hamilton of the Bank's Structural Economic Analysis Division.

The aggregate level of households' secured debt relative to their income has increased by about a quarter over the past five years, and has almost tripled since 1980. Using a simple model, this article concludes that much of this increase can be accounted for by the spread of homeownership and the fall in inflation (which has reduced the rate at which households' real debt burden is eroded over time). However, the model is unable to account for the full extent of the recent increase in secured borrowing growth. The model also suggests that, because only a relatively small fraction of the housing stock changes hands each year, the aggregate level of debt responds relatively slowly to changes in house prices. So the recent increases in house prices could lead to continuing increases in the debt to income ratio over the next five to ten years.

Introduction

The level of households' debt relative to their income was, in aggregate, stable for much of the 1990s but has increased from about 90% to 115% over the past five years. As shown in Chart 1, much of this increase reflects a rise in secured debt, which is the focus of this article. This rise was driven by strong borrowing, with annual growth picking up to 13% in 2002 (see Chart 2).⁽¹⁾ This was its fastest rate since 1990—when annual nominal income growth was over 10%, compared with under 4% in 2002.



85

1975

80



90

The increase in borrowing has the potential to increase households' vulnerability to falls in their income or

95

Chart 2 Households' borrowing growth



increases in interest rates. So establishing whether these trends are likely to persist or not is likely to be of importance to policy-makers. Godley and Izurieta (2003) conclude that 'the rise in the ratio both of debt to wealth and debt to income must eventually stabilise. [But that] Unfortunately there is no way of telling when the turning point will come.'

This article uses a simple accounting model to assess the extent to which the trends in secured debt and borrowing are associated with developments in the housing market and changes in the rate of inflation. This analysis therefore hopes to shed light on whether the increase in the debt to income ratio has been surprising, given these developments, and whether it is likely to continue over the next few years. After a brief

(1) In this article, secured borrowing growth has been calculated from the level of secured debt. All charts end in 2002.

2000

0

description of the model, this article discusses its ability to match the paths of debt and borrowing over the past 20 years and uses it to assess the relative contribution of different factors to these trends.

Description of model

The model analyses the effects of five main influences on secured debt and borrowing growth. First, changes in house prices relative to income. Second, movements in the loan to value ratio (LVR) for first-time buyers.⁽¹⁾ Third, variation in the relative popularity of repayment and interest-only mortgages. Fourth, the increase in the rate of homeownership. And fifth, the fall in inflation since the 1970s. Other factors—including households choosing to withdraw equity from their homes—are also likely to affect the level of secured debt and borrowing, but these channels are not quantified in this article.

The model can be thought of as a simple accounting framework which calculates a level of debt consistent with other features of the housing market. It does not attempt to explain those features, but is simply conditional on them. As discussed in more detail in the box, the model simulates, and aggregates, the amount of debt held by households at different stages in their life-cycles. All households in the model are assumed to follow the same pattern of house moves, with the structure of the model designed to reflect a number of representative features of the housing market in the United Kingdom. First, around a tenth of households are assumed to move each year, in line with the average turnover rate in the economy over the past 30 years. Second, households are assumed to hold secured debt for half the time over which they are homeowners, roughly matching the proportion of homeowners with mortgage debt. And third, households are assumed to move more often when they are young, which is consistent with actual behaviour.

As an illustration of the mechanics of the model, consider the effect of a permanent increase in the house price to income ratio. The pink lines on Charts 3 and 4 represent the simulated values from the model if nominal income and house prices rise by 4.5% per year,⁽²⁾ and if the homeownership rate, loan to value ratio for first-time buyers, and the proportion of interest-only to repayment mortgages remain unchanged. Given these settings, borrowing growth is 4.5% per year and the debt to income ratio remains

Structure of model

The model consists of a population of 50 cohorts of householders, who represent households aged between 25 and 75. All households follow the same pattern of house moves, with their first property purchased in their first year in the model, and subsequent moves taking place after 5, 10, 25 and 40 years.

House purchase in the model is financed via mortgages. First-time buyers are assumed to take out a 25-year mortgage, whose value is derived from the Council of Mortgage Lenders' (CML's) statistics. The debt of other households is given by their initial borrowing, minus an estimate of repayments of mortgage principal plus an estimate of any additional borrowing used to fund any moves up the housing ladder. This additional borrowing is given by an estimate of the difference between the prices of the properties that are bought and sold during each transaction. Both the initial and any additional borrowing are assumed to be fully repaid by the time that the householder is aged 50. The price of the house bought after five years is assumed to be 10% less than the CML's average price paid by former owner-occupiers (FOOs) and the price of the purchase after ten years is assumed to be 10% more.^(a) The prices of the subsequent transactions do not affect the level of secured debt in the model as they are assumed not to involve mortgage finance.

The model's estimate of the average value of borrowing per household is scaled up by a smoothed measure of the actual number of owner-occupied households with mortgages. The fraction of owner-occupiers with mortgages is derived from the Family Expenditure Survey, while the number of owner-occupied dwellings in the United Kingdom is taken from the Office of the Deputy Prime Minister's statistics.

(a) The CML's data do not distinguish between the prices paid by FOOs at different stages of the housing ladder.

⁽¹⁾ Loan to value ratios of former owner-occupiers are determined endogenously within the model.

⁽²⁾ This could represent annual inflation of 2.5% and real income and real house price growth of 2%.

Chart 3 Estimated effect of a change in the house price to income ratio on borrowing growth



Chart 4 Estimated effect of a change in the house price to income ratio on debt



constant. The blue lines show the simulated effect of a one-off 25% increase in the house price to income (HPI) ratio.⁽¹⁾ As the loan to value ratio is assumed not to change, this eventually results in a similar increase in the debt to income ratio. However, adjustment is very slow, with only 40% of the long-run response taking place within five years. This is because only a relatively small fraction of the housing stock changes hands each year, and a household's debt is only affected by the increase in house prices if it either entered the market, or traded up, after the time of the house price increase.⁽²⁾ Full adjustment occurs when all households have purchased their first house at the higher price, which by assumption takes 25 years in the model.

Although changes in house prices play a key role in the model, they should not be viewed as *explaining* changes

in debt.⁽³⁾ This is because the two are likely to be jointly determined: the price that a potential buyer would be willing to offer may depend on the amount of credit that is available and/or their appetite for debt. Therefore, the model can be thought of as simulating a level of debt that is *consistent* with current and previous values of house prices. It does not provide any insight into why the levels of house prices and debt may have changed, or whether these underlying changes are themselves sustainable.

Results from the model

Charts 5 and 6 present simulations from the model of the debt to income ratio and borrowing growth rates. These projections have been calculated by running the model using data for the house price to income ratio, LVR, homeownership rate, nominal income growth and mortgage type. Not surprisingly, the fit to the actual data is by no means perfect, suggesting that any forecast



Chart 6 Debt to income ratio: actual and simulated



The house price to income ratio in 2002 was about 25% higher than its average over the past 30 years.
 By assumption, the model ignores the possibility of discretionary equity withdrawal by households.

(2) By assumption, the model ignores the possibility of discretionary equity withdrawal by households.(3) For a discussion of factors that may have contributed to the recent increase in house prices, and with it higher debt

levels, see the box 'Structural economic factors affecting house prices', Bank of England (2002).

should be treated with caution. Nevertheless, despite not capturing all the year-to-year movements, it broadly matches the level of the debt to income ratio, its upward trend over the past 20 years, and some of the cyclicality of borrowing growth. So it may provide some guidance on what lies behind the recent trends in debt and borrowing, and on their likely future path.

It is possible that the failure of the model to capture the extent of the pick-up in borrowing growth in the late 1980s, and the sharpness of this slowdown in the early 1990s, is related to the short-lived increase in housing market turnover around that time (see Chart 7). An increase in the rate of transactions by former owner-occupiers may be important, particularly if they choose to withdraw equity when moving house, perhaps to fund the costs of moving home.⁽¹⁾ An increase in the number of first-time buyers may lead to an increase in the fraction of households with mortgages, or with high loan to income ratios, which might also lead to an increase in debt. Neither effect is captured within the model, which assumes that the rate of turnover is constant.

Chart 7 Housing market turnover^(a)



Sources: Council of Mortgage Lenders and Office of the Deputy Prime Minister.

(a) FTBs are first-time buyers and FOOs are former owner-occupiers.

Understanding the projections from the model

This section considers how changes in house prices relative to income, LVRs, mortgage types, homeownership rates and nominal income growth influence the projections from the model. The effect of each is evaluated by considering how a baseline projection, where all the factors remain constant over time, is changed by incorporating actual outturns for each factor. The baseline has been calculated by keeping the house price to income ratio, homeownership rate, LVR and the proportion of different mortgage types unchanged at their average levels over the past 40 years, and fixing nominal income growth to 4.5% per year.

As discussed above, it can take up to 25 years before the full effect of a shock to a factor feeds its way through the model. Therefore, although projections from the model are shown from 1985, they also reflect the cumulative effect of any changes prior to this date.

Although changes in each factor are considered separately, it is possible that they are sometimes related. For example, as discussed in Bank of England (2002), the house price to income ratio may be boosted by a fall in inflation. This is because lower inflation reduces initial nominal payments on a mortgage, which might relax credit constraints for some households and enable them to finance higher debts, thereby increasing housing demand and thus house prices. Similarly, changes in the homeownership rate may change the balance between housing supply and demand, affecting house prices. In practice, the model would attribute the effects of both to variation in house prices, rather than to their underlying cause.

Variation in house prices relative to income

Chart 8 shows that the aggregate house price to income ratio has increased by about 50% over the past five years. The ratio had previously peaked in the early 1970s and late 1980s and troughed in the mid-1970s and mid-1990s.

Chart 8 House price to income ratio per person of working age



(1) Ortalo-Magné and Rady (2002) present a model in which housing turnover is restricted by transactions costs. An increase in house prices (as occurred in the late 1980s) increases housing equity and reduces any credit constraints caused by these costs, enabling an increase in turnover.

Charts 9 and 10 show the model's estimate of how these changes would have been reflected in the debt to income ratio and in borrowing growth. The calculated effect is the difference between the blue 'baselines', where all the factors are kept constant, and the orange lines, which use actual data for the house price to income ratio but keep the other factors unchanged.

Chart 9





Chart 10 Simulated effect of changes in the house price to income ratio on debt



The model suggests that previous fluctuations in the house price to income ratio have had important influences on the rate of borrowing, with growth boosted in the late 1980s but held back in the mid-1990s. However, the overall effect on the debt to income ratio is estimated to have been quite modest, partly because the changes in the house price to income ratio were relatively short-lived compared with the speed of adjustment of the debt level.

The model also suggests that the increase in house prices relative to income since 2000 was accompanied by a rise in borrowing growth. As discussed above, the model predicts that this increase will eventually lead to a similar rise in the debt to income ratio. But, since the estimated speed of adjustment is so slow, the model suggests that most of this increase has yet to feed through.

When considering these results, it is important to note that this model only captures the relationship between house prices and secured debt used for house purchase. In practice, existing homeowners may choose to respond to an increase (reduction) in house prices by withdrawing (injecting) equity from their homes. Indeed, this may partly explain the recent strength of remortgaging and mortgage equity withdrawal. If this is the case, the speed of adjustment to the new steady state may be faster than the model suggests, and the further increase in debt that is consistent with the recent increase in house prices may be smaller.

Movements in loan to value ratios

Chart 11 shows that the loan to value ratio for first-time buyers has fluctuated at around 80% over the past 30 years. The model suggests that such small fluctuations should have had negligible effects on borrowing growth, and thus on the level of debt relative to income.

Chart 11 Loan to value ratios at house purchase for first-time buyers



Differing popularity of repayment and interest-only mortgages

Chart 12 shows that the share of new mortgages that are repayment rather than endowment (or other types of interest-only mortgage) declined from around 90% in 1970 to under 20% by the late 1980s. Since then, their popularity has increased, to almost 80% in 2002.

Chart 12 Relative popularity of repayment mortgages^(a)



Chart 13

Simulated effect of variation in mortgage type on borrowing growth



Chart 14 Simulated effect of variation in mortgage type on debt



The average level of secured debt over the lifetime of a repayment mortgage is lower than with an

interest-only mortgage. This is because the debt is gradually repaid over the life of the mortgage, rather than being fully repaid at the end of the loan.⁽¹⁾ The model suggests that the combined effect of the changes in the relative popularity of different mortgage types has had only a modest upward effect on borrowing growth, and thus on the debt to income ratio (see Charts 13 and 14).

Homeownership rates

The homeownership rate (defined here as the number of owner-occupied dwellings divided by the population of working age, to abstract from population growth) has increased by almost a half since 1975 and about a quarter since 1985 (see Chart 15).⁽²⁾ Much of this increase reflects a general trend towards a lower number of adults per dwelling, although ownership was also boosted by council house sales.





The simulated value of debt from the model is calculated by scaling up its estimate of debt per household by the rate of homeownership in the United Kingdom.⁽³⁾ This means that a percentage change in homeownership is predicted to lead to an equivalent increase in debt. The model therefore suggests that the increase in the homeownership rate over the past 30 years boosted borrowing growth and led to a substantial rise in the debt to income ratio (see Charts 16 and 17). So a significant part of the rise in the debt to income ratio is likely to reflect an increase in the number of households with debt, rather than an increase in the amount of debt per household.

(1) Although a household's average debt is higher with an interest-only mortgage than a repayment one, so too are its financial assets—as these are accumulated to pay off the mortgage.

(2) This analysis abstracts from population growth by using the rate rather than the level of homeownership. Population

growth is likely to increase both aggregate income and the number of dwellings.(3) The proportion of owner-occupiers that have mortgages has barely changed over the past 20 years (increasing from

67% to 69%) so the effect of variation in this factor has not been separately identified in this article.

Chart 16

Simulated effect of changes in homeownership on borrowing growth



Chart 17

Simulated effect of changes in homeownership on debt



The model's estimate of debt only takes into account borrowing on properties that are owner-occupied, and not those that are rented out. Data from the Council of Mortgage Lenders indicate that buy-to-let mortgages have increased from 0.4% of all mortgage debt in 1998 to 3.6% by the end of 2002. In practice, this increase is likely to have boosted borrowing growth, and thus the aggregate level of debt relative to income. But the rate of owner-occupation used in the model does take into account shifts of properties either into or out of the rental sector. Although the model suggests that such changes have affected households' debt, at the aggregate level they would also have been offset by changes in the finances of the other sector(s).

Inflation and nominal income growth

The annual rate of retail price inflation in the United Kingdom has varied considerably over the past 30 years (see Chart 18). Annual inflation has averaged about 3% since 1990, compared with over 7% in the 1980s and almost 13% in the 1970s. Like other nominal variables,

the growth rates of income, house prices and borrowing are all likely to have been reduced by the fall in the level of inflation.



Within the model, the effect of changes in inflation (together with changes in real income growth) is captured by varying the nominal income input. For a given house price to income ratio, variation in nominal income growth feeds through into house price inflation, and thus into secured borrowing growth. Chart 19 shows the effect of incorporating actual income growth into the model. As expected, simulated borrowing growth rates over the past 20 years are significantly higher than in the baseline scenario, where nominal income and house prices increase by 4.5% per year. However, as inflation has fallen, the model suggests that this positive effect on borrowing growth will have eased.

Chart 19

Simulated effect of changes in inflation on borrowing growth



Inflation has no effect in the model on the amount of borrowing relative to income undertaken by households when purchasing their first property. But it does affect the rate at which the real value of this borrowing is eroded over time, and thus the average level of debt relative to income over the lifetime of a mortgage. Chart 20 shows that (for a given initial level of borrowing relative to income and unchanged real income growth) the average value of the debt to income ratio over the life of a 25-year mortgage is about 40% higher if inflation is 2.5% rather than 10%.

Chart 20 Effect of inflation on a household's debt to income ratio^(a)



(a) Assuming real mortgage rate of 2.5% and real income growth of 2%, a 25-yea repayment mortgage and that debt is initially twice annual income.

Chart 21 shows the model's estimate for how changes in nominal income growth have affected the aggregate debt to income ratio by changing the rate of debt erosion. The blue baseline gives the simulated values if nominal income growth is fixed at 4.5% per annum and the other factors remain constant. The red line shows the projection including data for nominal income. High nominal income growth in the 1970s and 1980s is estimated to have had a significant downward effect on the aggregate debt to income ratio at the beginning of

Chart 21 Simulated effect of inflation on debt



the sample period. As the growth rate of nominal income has declined, this negative influence has eased and the aggregate level of debt relative to income has increased. The model also suggests that adjustment of the debt to income ratio to the level of inflation is slow (reflecting the slow turnover of the housing stock discussed above). So, looking forward, the model predicts that continued adjustment to the current lower level of inflation may lead to a further small increase in the level of debt relative to income.

It is also possible that variation in the rate of inflation also leads to other changes in borrowing that are not captured in the model. For example, as discussed above, credit constraints may mean that the level of inflation has an effect on house prices, and thus on debt. Or it is possible that a higher rate of debt erosion during periods of higher inflation enabled households to trade up the housing ladder more easily, or withdraw equity from their homes.

Summary and conclusions

This article uses a highly stylised model of the housing market to explore trends in households' secured debt and borrowing growth. As shown in Chart 22, the model suggests that the long-run increase in debt relative to income has mainly been associated with the rise in homeownership and the reduction in the level of inflation over the 1990s (which has reduced the rate of inflation erosion of the debt burden). However, the fit of the model is not perfect, and it is unable to explain all the short-term fluctuations, including the extent of the pick-up in secured borrowing growth since 2000.

Chart 22 Estimated contributions to the cumulative change in the debt to income ratio from 1985



The model also simulates a level of debt that is consistent with current and previous values of house prices. It suggests that, because only a relatively small fraction of the housing stock changes hands each year, the aggregate level of debt responds relatively slowly to changes in house prices. And, even under the stylised assumption that house price inflation were to slow to around zero over the next two years before picking up thereafter to the rate of nominal income growth,⁽¹⁾ it predicts that the level of debt relative to income is likely to continue to rise over the next five to ten years.

This path for house prices would imply that the increase in the house price to income ratio since 1995 is only partly reversed.

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Public expectations of UK inflation

By Clare Lombardelli and Jumana Saleheen of the Bank's Monetary Assessment and Strategy Division.

Every quarter, NOP carries out a survey of the inflation expectations of the general public. This article illustrates how expectations vary according to individuals' different circumstances, and tries to explain how these differences might occur.

Introduction

The Bank of England's Monetary Policy Committee (MPC) is currently charged with the task of achieving the government's inflation target for retail prices excluding mortgage interest payments (RPIX) equal to 2.5%. People use their expectations of inflation to help them make economic decisions, and these decisions affect actual future inflation. Therefore, knowledge about the public's expectations for inflation is useful for the MPC in seeking to achieve low and stable inflation. Furthermore, the public's expectations of inflation provide an indication of the performance and credibility of monetary policy. If people believe the MPC will achieve its inflation target, they will expect future inflation to be around 2.5%.

This article examines public expectations of UK inflation using the responses to an opinion survey. The data we use allow us to answer questions such as: are individuals able to form reasonable expectations for inflation? How do these expectations vary across individuals? Does an individual's expectation of inflation depend on his or her experience of inflation?

The inflation attitudes survey

The simplest way to gauge people's expectations for inflation is to ask them what they expect. In 1999, the Bank, in collaboration with the market research agency NOP, devised an inflation attitudes survey. This survey explores public opinion and awareness of monetary policy matters. The survey asks a range of questions that examine public knowledge and understanding of, and attitudes towards, the MPC process, including people's expectations of inflation.

The inflation survey is conducted quarterly, based on a sample of 2,000 individuals. The February survey questions 4,000 individuals.⁽¹⁾ In this article we analyse data from the February 2001, 2002 and 2003 surveys, to enable a more disaggregated analysis of the responses. Different individuals are questioned each year, and so this allows us to analyse the inflation expectations of around 12,000 people. The survey is designed to capture a sample of respondents that is representative of the UK adult population. For each survey respondent we have data for their expectations for economic variables such as inflation and interest rates, and their demographic characteristics, such as age, education level, and region.⁽²⁾

The question asked in the survey is 'How much would you expect prices in the shops generally to change over the next 12 months?' The survey is conducted face-to-face. Each respondent is given a flash card with a number of ranges for their expectation of inflation and asked to select one, therefore each inflation expectation is expressed as an interval.

Different people may interpret the question posed in different ways. The Bank of England is currently charged with maintaining the stability of RPIX. But individual survey respondents may interpret the question as being about goods only, while others may interpret it as referring to the cost of living. And

⁽¹⁾ The February survey samples twice as many people as the surveys in other quarters. It also contains five additional questions about people's beliefs about the transmission mechanism. These questions are not included in the survey each quarter because in trials the responses to these questions varied little from quarter to quarter.

⁽²⁾ The responses to all the questions in the inflation attitudes survey are discussed annually in the Summer *Quarterly Bulletin.*

different respondents may have different notions in mind when answering the question. We can never know exactly what prices people are thinking of when they report their expectation of inflation.⁽¹⁾

Question: How much would you expect prices in the shops generally to change over the next 12 months? Go down Not change Up by 1% or less Up by 1% but less than 2% Up by 2% but less than 3% Up by 3% but less than 4% Up by 4% but less than 5% Up by 5% or more No idea

What do the responses look like?

Actual inflation differed in each of the three years for which we examined the survey responses. Table A shows the inflation rate in each year, and the average expected inflation rate from the survey taken in February of the same year. We can see that in 2001 and 2002 average inflation expectations were slightly above, but close to, actual inflation. This suggests that on average the general public forms accurate inflation expectations for the coming year. In the most recent survey, taken in February this year, average inflation expectations rose to 2.6%. This may reflect the fact that RPIX inflation has been consistently above the 2.5% target since November 2002.

Table A

Actual and expected inflation(a)

Per cent			
	2001	2002	2003
Actual inflation	2.1	2.2	
Average expected inflation	2.2	2.3	2.6

(a) These averages are reported by NOP. The interval mid-point is used to calculate the average response. For respondents who answer 'go down' the mid-point is taken as zero, for the '5% or more' response the mid-point is taken as 5.5%.

Taking an average across all the respondents does not give us a full picture of how expectations for inflation differ across the respondents. Without knowing the distribution of expectations across individuals we cannot know how many people are forming accurate expectations.⁽²⁾ Chart 1 shows the distribution of responses across different intervals in the February 2003 survey.

Chart 1 Public inflation expectations in February 2003



It turns out that the responses have shown a similar pattern each year. The average expected inflation rate from respondents in February 2003 was 2.6%. But within this average there is some interesting variation. Although RPIX inflation has not been outside a range of 1% to 4% for over ten years, only around half of respondents expect inflation to be within this range in the following year. One in ten people expect inflation to be negative or zero and one in seven people expect inflation to be as high as '5% or more'. The same number, one in seven respondents, reported that they have 'no idea' what they expect inflation to be over the next twelve months.

Different people, different expectations?

This section turns to answer the following questions. Are there any systematic patterns to the differences in expected inflation? Are some people better judges of inflation than others? And do particular demographic groups expect prices to rise more quickly or slowly than other groups?⁽³⁾ If we look at inflation expectations across individuals we can see some systematic differences. Chart 2 shows the inflation expectations for two different types of occupational groups. The mean expectation for both occupational groups shown is the interval 2% to 3%. The expectations of inflation of those people who can be described as professional and managerial workers are more clustered around the mean; and fewer of this group give the response 'no idea'. Different occupational groupings have the same expectations for inflation on average. But the distribution around the average expectation is different.

⁽¹⁾ The difficulty in ascertaining the beliefs underlying survey responses is discussed in detail in Hansen et al (1953).

⁽²⁾ The importance of considering forecasts individually is discussed by Keane and Runkle (1990).

⁽³⁾ For a discussion of how inflation expectations in the United States vary across demographic groups see Bryan and Venkatu (2001).

Chart 2 Inflation expectations across occupational groupings

Semi-skilled, unskilled and benefit dependent Professional and managerial Percentage of respondents 30



When we turn to the expected inflation rates of different age groups we find that on average different age groups expect different inflation. In particular younger respondents—those aged 15–34—have lower inflation expectations. But across age groups the distribution of expectations around the mean is similar (see Chart 3).

Chart 3 Inflation expectations across different age groups



Chart 4 shows inflation expectations across different forms of housing tenure. Interestingly the inflation expectations of those who pay a mortgage appear to differ from the rest of the population. Mortgage payers have lower inflation expectations, with more respondents expecting inflation to be 1% or less in the coming year. Far fewer also report that they have no idea what to expect for inflation.

Chart 4 Inflation expectations across housing tenure



We can examine the differences in responses to the inflation attitudes survey in more detail using regression analysis. This allows us to calculate the effect of particular characteristics on the inflation expectations of an average person. The results of this analysis are shown in Table B. The average inflation rate of the reference group is shown, and the average effects of different characteristics are listed. The reference group is male, 35–44, working in an administrative or non-management executive position, educated to 16, living in the north of England and paying a mortgage.

Table B

Average effect of different characteristics on expected inflation

		2001	2002	2003
Average expected inflation of reference group		1.96%	+0.12(a)	+0.56(a)
Effect of different	characteristics o	n inflation exp	ectation (basis	s points):
Age	15–24 25–34 45–54 55–64 65+	15 -8 13 35 15	25	28
Left school	Under 16 17–18 19+	6 -5 -27		
Region	Scotland Midlands Wales and west South and east	-15 -2 -17 37	28 -18	34 23 25 -38
Housing status	Homeowner Council tenant Private tenant	10 43 16		

Note: The reference group is male, 35–44, working in an administrative or non-management executive position, educated to 16, living in the north of England and paying a mortgage.

(a) Percentage points.

For example, people who live in a council-owned property have inflation expectations that are 43 basis

points higher than the expectations of respondents who pay a mortgage; their inflation expectations are 2.39% compared with 1.96%. Respondents in the age category 45–54 have higher inflation expectations on average than those in the reference age group 35–44. This effect varies in each of the three years. In 2001 their expectation was on average 13 basis points higher, in 2002 it was 38 basis points higher (13 + 25), and in 2003 it was 41 basis points higher (13 + 28). The regression technique used and full results are given in Appendix A.

One of the strongest results from our analysis is that older people expect higher inflation. Inflation expectations are generally increasing with age, with the exception of pensioners, whose expectations are slightly lower than those in the age group below them. Why might this be? One possibility is that older people have higher expectations for inflation because they have experienced periods of higher inflation over their adult lives.⁽¹⁾

Chart 5 shows actual inflation for the past 50 years, and plots the average inflation rate experienced by people of different age groups. We see that in general older people have on average observed higher inflation. People in the age group 45–54 have experienced the highest level of inflation, an average inflation rate of 7.3% over their adult lives. We test whether inflation expectations are associated with lifetime experiences of inflation formally in Appendix A. And we find that lifetime inflation expectations.

Chart 5





Our regression results also show that inflation expectations held by the public differ across geographical region. In particular people living in the south and the east of the United Kingdom have higher expectations of inflation than those living elsewhere. An article in the Summer 2001 *Quarterly Bulletin* shows that economic activity in the South has been stronger than elsewhere in the United Kingdom.⁽²⁾ But, perhaps surprisingly, evidence seems to suggest that there are no significant differences in regional inflation. The Croner Reward Group produces cost-of-living indices for different regions in the United Kingdom,⁽³⁾ and analysis of these data shows that there are no significant differences in regional inflation.

So what can be influencing people in the south and the east of England, and causing them to have higher expectations of inflation than people living elsewhere? The cost-of-living indices produced by the Croner Reward Group use the local prices of goods and services. We cannot use these data to say anything about regional changes in housing costs. But remember the exact wording of the survey question, 'How much would you expect prices in the shops generally to change...?' This suggests that people's answers should not be influenced by their housing costs.

But perhaps the interpretation is not so simple. People may subconsciously include housing costs when answering such a question. Or perhaps they will be aware of the media attention on property prices in the past few years. Given that housing takes up around 18% of households' expenditure, it is possible that housing costs affect perceptions of price changes even if people do not consciously think of them when answering a survey question about their expectations for inflation.

So what happens if we consider regional housing costs? Over certain periods, differences in regional house prices⁽⁴⁾ are correlated with differences in inflation expectations; where property prices have risen most quickly, expectations of inflation are higher, and in areas of the United Kingdom where property prices have been more subdued, the general public has lower expectations of inflation. This can be seen in Chart 6, and is supported by the regressions reported in Appendix A.

information is available from www.reward-group.co.uk.

⁽¹⁾ Here adult life is taken as over the age of 20.

⁽²⁾ See Morris (2001).

⁽³⁾ The data used are taken from Cost of living regional comparisons published by the Croner Reward Group. Further

⁽⁴⁾ The data used are from The Nationwide House Price Index. We use average annual house price inflation rates over the past ten years compared with the inflation expectations from the 2001, 2002 and 2003 surveys.



Despite the focus in the question on 'prices in the shops', housing costs may be associated with people's expectations for inflation. Further evidence for this hypothesis is that inflation expectations vary according to what type of housing tenure people hold. People renting their home hold higher expectations for inflation than those who own their home outright or are paying a mortgage on it. This is true for both tenants who are renting privately or are living in council accommodation. But surely owner-occupiers will be more aware of recent attention on house price inflation? Property prices have risen sharply over the past few years, so it seems reasonable to expect homeowners to have experienced higher rates of inflation in their housing costs.

When we examine the data, this turns out not to be true. Chart 7 shows the changes in the costs of different

Chart 7



Changes in housing costs over the past 15 years

for mortgages by an average household. See the ONS publication Retail Prices Index Technical Manual for further details.

(1) See Bank of England (2002), pages 34–35 and Crawford and Smith (2002) for details.

(2) The UK Family Expenditure Survey is a random cross-sectional survey that collects information on the characteristics and detailed expenditure of around 7,000 households. In April 2001 it was replaced by the Expenditure and Food Survey.

forms of housing over the past 15 years. It turns out that people living in rented accommodation have experienced high levels of inflation in their cost of housing. Over certain periods these rises have been even higher than house price inflation. So perhaps this goes some way to explaining why people living in rented accommodation have higher expectations for inflation.

Individual expectations, individual inflation

One reason why different people may hold different expectations for inflation is that they consume different combinations of goods and services. This means that each individual has their own personal basket of goods and services and so they have their own unique inflation rate.⁽¹⁾ The inflation attitudes survey asks for people's expectations for inflation across the whole economy. This section considers whether respondents' expectations of inflation are related to their personal consumption patterns. Using information about the goods and services individuals buy and the inflation attitudes survey we can examine how, if at all, people's expectations for inflation are influenced by changes in the prices of the goods and services they consume.

The Family Expenditure Survey (FES)⁽²⁾ gives a breakdown of the individual goods and services consumed by each household, as well as the household's characteristics. From this, the actual inflation rate experienced by each household over the previous year can be calculated. We can compare this with inflation expectations for the next twelve months to examine the relationship between expected inflation and actual inflation. To do this we match the characteristics across the two surveys; for example, we take an estimate of the inflation rate experienced by individuals who live in the north of England, are educated to 19 and so on, and compare this with the inflation expectations of individuals with the same characteristics.

When we analyse these two surveys in this way we find that, when responding to the survey question about expected inflation, people do abstract from their individual inflation rate. The details of this analysis are presented in Appendix B. We find that people do not use the inflation rate they experienced in the previous year to form their expectations. There are a number of reasons why this may be the case. In the previous section we found that individuals' inflation expectations were related to their lifetime experience of inflation. That suggests that individuals base their expectations of future inflation on what has happened over a number of years rather than just the previous year.

It may be the case that people are unable to judge their own inflation rate. An individual's inflation rate is a weighted average of all the price changes that he or she experiences over a year. To calculate this, a lot of information about price changes and computations is required and it is unlikely that most people would spend the time and effort making this calculation for themselves. Alternatively they may get the majority of their information about economic variables from the media, even if they do augment this information with their own experience.

The two surveys are for different people. Perhaps the match between the surveys is not that close. The people who live in the north of England, are educated to 19, etc captured in the FES may be a very different group from that with the same characteristics in the inflation attitudes survey. We may be picking up sampling error.⁽¹⁾

We can use the inflation attitudes survey to examine to what extent people accurately report their own inflation rate. One of the questions in the survey asks people what they think inflation has been over the past year. If we match this to the actual inflation rate they have experienced over the same time horizon, again using the Family Expenditure Survey, we find that people's beliefs about inflation over the past twelve months are not related to the price changes they have experienced in the past year. This may be because they are not trying to report their individual experience of inflation, or because they are unable to.

Conclusions

Around half of the UK general public surveyed expects inflation to be between 1% and 4%. However, inflation expectations vary systematically across the population. In particular, age, geographical location, education, and housing status are all associated with different inflation expectations. We provide evidence that the variation in inflation expectations is not being driven by variation in individual consumption patterns. Rather, expectations are related to factors such as the lifetime experiences of inflation, and housing costs.

(1) Technical factors in the construction of the FES inflation data may also play a role. The FES data are for RPI inflation. To construct the individual inflation rates Crawford and Smith (2002) make certain assumptions about housing costs. For example, they assume council tenants have zero housing costs. So a council tenant who uses high rent increments to inform his view on high future inflation would be at odds with the low measure of actual inflation.

Appendix A Estimating a model of inflation expectations

The dependent variable, inflation expectation, is an interval variable. This means that for each individual, *j*, in the survey, we know their expectation for inflation lies in the interval $[y_{1j}, y_{2j}]$. Individuals are coded as missing where they gave the expectation 'no idea'. The model is consistently estimated by a maximum likelihood procedure. The model assumes that the responses in each interval are distributed normally, and so it is the mid-point in the interval that is used to represent the inflation expectation. For the censored interval no mid-point is assumed and the likelihood function consists of probabilities for the left/right-censored observations.

In Model 1 we estimate an interval regression model of inflation expectations over the demographic characteristics. These are given by a series of dummy variables, for example the variable 'age' is represented by six dummy variables, one for each age range. These take the value of one if the person's age is in the range, zero otherwise. The model is estimated relative to a reference group. This is male, aged 35–44, working in an administrative or non-management executive job, educated to 16, living in the north of England and

Model 1 Inflation expectations across demographics

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.962 0.088	0.118 0.072	***0.559 0.093
Age	15-24	*0.153		
	25-34	-0.085 -0.075 0.063		
	45-54	0.129	**0.251 0.128	***0.284
	55-64	***0.35	01120	0.120
	65+	*0.149 0.085		
Left school	Under 16	0.062		
	17-18	-0.049		
	19+	***-0.266 0.061		
Region	Scotland	-0.149 0.950		**0.337 0.168
	Midlands	-0.019		*0.232
	Wales and west	-0.166 0.106	**0.277 0.141	*0.249 0.154
	South and east	***0.366 0.084	*-0.184 0.107	***-0.375 0.124
Housing status	Homeowner	0.095		
	Council	***0.429		
	Other	**0.161 0.067		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.

paying a mortgage. Therefore the regression results give the marginal effect of being in each group relative to the reference group.

We find that a number of demographic characteristics have an insignificant effect on inflation expectations. Differences in gender, social class and working status are not associated with differences in inflation expectations. These are not reported in our models. To some extent we expect the education dummies to be picking up some of the effects of social class.

We pool the data across years, but also include interaction dummies for each characteristic in the different years where they are significant. The numbers in the fourth and fifth columns indicate the years when the particular characteristic has a significantly different effect on expected inflation. The effects for 2002 and 2003 are given in the fourth and fifth columns respectively. For example, if we look at the pattern of inflation expectations across different age groups we see that the effect of being in the age group 45 to 54 is greater in 2002 and 2003 than in 2001. The significance of the positive dummy (the constant term) for 2003 captures the effect of the average expected inflation being much higher in this year.

In Model 2 we substitute the average adult-life inflation rate for the age dummies. The results show that

Model 2 Lifetime inflation experience

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.687 0.099	***0.180 0.068	***0.636 0.091
Lifetime inflation experience		***0.069 0.012		
Left school	Under 16	0.065		
	17-18	-0.035		
	19+	***-0.265 0.062		
Region	Scotland	*-0.259 0.095		**0.358 0.168
	Midlands	-0.026 0.077		*0.236 0.134
	Wales and west	*-0.174 0.106	*0.282 0.141	*0.263 0.154
	South and east	***0.360 0.084	*-0.191 0.107	***-0.363 0.124
Housing status	Homeowner	**0.120 0.060		
	Council	***0.449 0.064		
	Other	***0.190 0.099		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.
inflation expectations vary positively with inflation experience. This effect is significant at the 1% level. Model 3 substitutes regional house price inflation for the regional dummies. We find that inflation expectations vary positively with regional house price inflation, again this effect is significant at the 1% level.

Model 3 Regional house price inflation

		Coefficient standard error	Variation in 2002	Variation in 2003
Constant		***1.717 0.120	*0.099 0.053	***0.538 0.054
Age	15-24	*0.148		
	25-34	-0.082		
	45-54	0.126 0.100	*0.249 0.128	**0.285 0.130
	55-64	***0.348 0.078		
	65+	*0.146 0.085		
Left school	Under 16	0.064		
	17-18	-0.044		
	19+	***-0.264 0.062		
Regional house price inflation		***0.050 0.014		
Housing status	Homeowner	0.089		
	Council	***0.418		
	Other	**0.15		

*, **, *** indicates significance at 10%, 5% and 1% level respectively.

Appendix B Testing the effects of individual inflation rates

We compare survey respondents' inflation expectations with the actual inflation in the goods and services purchased by someone with the same demographic characteristics. The Family Expenditure Survey (FES) tells us how the prices of goods and services consumed by different people have changed.⁽¹⁾ We use the inflation attitudes survey taken in February 2001, and compare this with the FES in the previous year, that is April 1999 to March 2000.

To test if people use their previous experience of inflation to form their expectations of inflation, we run the regression:

 $\pi_{tj}^{e} = \alpha + \beta \hat{\pi}_{t-1j} + \varepsilon_t$

where π_{ij}^e is the inflation expectation at time *t* of person *j* taken from the inflation attitudes survey and $\hat{\pi}_j$ is an estimate of the actual inflation rate experienced by someone with the same demographic characteristics. $\hat{\pi}_j$ is constructed from the FES. ε_t is assumed to be independently and identically distributed $N(0,\sigma^2)$. If the hypothesis that people use their personal inflation rates to inform their expectations for inflation the following year is correct, then β would be positive. But we find β is negative (β = -0.1, significant at the 1% level), showing that differences in inflation expectations are not driven by differences experienced by individuals in their consumption baskets.

To test if people accurately report changes in the prices they experience we use the inflation attitudes survey responses to the question 'Which of these options best describes how prices have changed over the last 12 months?' We then run the regression:

$$\pi_{tj}^{p} = \alpha + \beta \hat{\pi}_{tj} + \varepsilon_{t}$$

where π_{ij}^p is the perceived inflation reported by individual *j* in response to the survey. If people answer the question by accurately reporting the inflation rate for the goods and services that they consume, this would imply β equal to one. Again we reject the hypothesis, finding β is significantly negative.

⁽¹⁾ We are very grateful to Ian Crawford and Zoe Smith for providing us with the data on inflation rates for each household and the ESRC data archive for providing us with the FES data.

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Non-employment and labour availability

By Jerry Jones, Michael Joyce and Jonathan Thomas of the Bank's Structural Economic Analysis Division.

According to the Labour Force Survey, about 20% (approximately 7.5 million) of the non-student working-age population were not in paid employment in 2002. Of these people about one in five were classified as unemployed, with the remainder labelled as 'inactive'. Despite this categorisation, however, some groups in the so-called inactive population are as likely to move into employment as those classified as unemployed, so any comprehensive measure of labour availability needs to incorporate information on the characteristics of the non-employed pool as a whole. This paper describes the key trends in the demographic and skill structure of the non-employed population since the mid-1980s and contrasts them with those in employment. It also attempts to draw out the implications of these trends for overall labour availability, building on recent Bank research which models individual transition rates from non-employment into employment.

Introduction

Although the UK unemployment rate has fallen over recent years to levels last seen over two decades ago, wage inflation has remained remarkably subdued by historical standards. This coincidence of low and falling unemployment and stable wage inflation has often been thought of as a 'puzzle' requiring explanation. Economists typically explain this phenomenon by pointing to reasons why the equilibrium or natural rate of unemployment may have fallen.⁽¹⁾ For example, Nickell (2001) suggests that the main factors behind the fall in equilibrium unemployment over the past 20 years have been the declining role of trade unions in wage bargaining and the tightening of the benefit system. But one other factor that may also be relevant to explaining the lack of response of wage inflation to an apparently tighter labour market is that the unemployment rate itself may be too restrictive a measure of labour availability.

The definition of unemployment used in the Labour Force Survey (LFS) only includes people without a job, who have actively sought work in the past four weeks and are available to start work in the next two weeks, and people out of work, who have found a job and are waiting to start it in the next two weeks.⁽²⁾ According to the LFS, about 7.5 million of the non-student working-age population were not in paid employment in 2002. Of these people, only about one in five satisfied the criteria for unemployment, with the remaining six million labelled as 'inactive', or out of the labour force.

The working-age inactive population is diverse and includes students, those who are sick and disabled. those taking care of family members and those taking early retirement. Most of these groups are less likely to start working than people recently made unemployed, but analysis of longitudinal data on employment flows suggests that some groups in the inactive population are as likely to move into employment as some categories of the unemployed.⁽³⁾ And, even though the likelihood of moving into employment from inactivity is lower on average than it is from unemployment, the large size of the inactive population means that these transitions can still make a substantial contribution to employment growth, particularly during economic expansions when unemployment falls. One implication is that focusing solely on unemployment as a measure of labour slack in the economy may be misleading, and that any comprehensive measure of labour availability needs to

⁽¹⁾ The underlying assumption is that the degree of labour market imbalance, or 'tightness', is best measured by the gap between unemployment and its equilibrium or natural rate. For a discussion of the concept of labour market tightness in theory, see Brigden and Thomas (2003).

⁽²⁾ This is the definition of unemployment recommended by the International Labour Organisation (see Office for National Statistics (2001)).

⁽³⁾ This point was first brought out in a number of papers by Gregg and Wadsworth (1998, 1999).

take into account the size and composition of the non-employed population as a whole.⁽¹⁾

There is, however, no generally accepted way of combining information on the non-employed to measure labour availability (or labour slack). The usual practice is to look at an extended definition of unemployment. For example, the Employment Policy Institute (1999) in the United Kingdom used to report several alternative measures, which included some categories of inactivity, drawing on earlier work by Gregg and Wadsworth (1998) which had highlighted the relatively high employment transitions of some groups of the inactive population. Influenced by this work, the Bank of England Inflation Report has occasionally reported a weighted index of non-employment, which combines the different categories of the unemployed and inactive populations according to their relative transition rates into employment (Bank of England (1999)). More recent research at the Bank by Schweitzer (2003) extends this idea by modelling employment transitions from non-employment using individual-level data on labour force status and other characteristics, in order to generate a comprehensive measure of labour availability.

The aim of this article is twofold: first, to provide a brief review of the key trends in non-employment since the mid-1980s; and second, to draw out the implications for labour availability, using a model-based approach explaining individual transitions into employment. Unless indicated otherwise, all the analysis refers to those of working age and not in full-time education, and uses annual LFS data from 1984 onwards.⁽²⁾ We exclude students⁽³⁾ from our descriptive analysis, to abstract from the large expansion in higher education over the period, though we include them in one of the measures of labour availability that we report below. It should also be kept in mind that, since the data we report have been aggregated from the underlying individual responses in the LFS, they are not consistent with the Census 2001 results.⁽⁴⁾ For this reason, our analysis is expressed mainly in terms of rates (for the most part, relative to the relevant non-student, working-age population), which should be less sensitive to any revisions associated with the latest Census results.

The structure of the article is as follows. The second section describes the main trends in working-age non-employment since the mid-1980s and assesses the main demographic and skill differences between the inactive and the unemployed. The third section makes comparisons with the employed population. In the fourth section we describe trends in both aggregate and disaggregated employment transition rates. The fifth section explains a method of combining this information with information on the structure of non-employment to derive an overall measure of labour availability, drawing on recent research at the Bank. We also extend this measure back to the mid-1980s using 'recall' data on transitions from the LFS, in order to assess longer-run trends in labour availability. The last section presents conclusions.

Trends in the structure of non-employment

In this section we begin by briefly reviewing the main aggregate trends in working-age non-employment (excluding students), before going on to examine trends by gender, age and education qualifications. We also set out the reasons behind the trends in inactivity, using the responses given by respondents to the LFS. (For a fuller analysis of inactivity trends, see eg Nickell (2001) and Gregg and Wadsworth (1998, 1999).)

Aggregate trends

Abstracting from obvious cyclical movements, the trend in the aggregate working-age non-employment rate (excluding students)⁽⁵⁾ shows a clear downward path over the period since 1984 (see Chart 1). This decline has overwhelmingly reflected declining unemployment, which fell by 1.5 million or nearly 5 percentage points from 1984 to 4.0% in 2002, with most of this fall occurring after 1992. Though this comparison is probably distorted by the different cyclical positions in 1984 and 2002, the comparison between 1990 and 2001 (the past two troughs in the unemployment rate) suggests that a large part of the decline is structural.

In contrast to unemployment, the inactivity rate since the mid-1980s has remained remarkably stable at a little under 20%. As a result, the share of inactivity in total working-age non-employment has increased significantly

(1) More generally, as Nickell (2001) has most recently pointed out, inactivity is one of the key elements affecting potential output.

(2) The annual figures refer to the spring quarter of each year.

(3) Students are defined as working age individuals who are in full-time education; individuals receiving job-related training while employed, such as nurses, are not counted as students. On this definition, there were 1.3 million students in 1984, rising steadily to 1.8 million in 2002.

⁽⁴⁾ The ONS plans to regross the micro LFS data in line with the results from the 2001 Census later in 2003.

⁽⁵⁾ The denominator for all rates is the working-age population excluding full-time students.

over the period, from around 70% in the mid-1980s to just over 80%. This increase was concentrated in the period after 1992 (see Chart 2), during which working-age inactivity rose by about 300,000 while unemployment fell by 1.3 million.

Gender differences

The aggregate picture conceals very different trends for men and women. While the non-employment rate for men has remained little changed, the female non-employment rate has declined consistently since the mid-1980s. As can be seen from Charts 3 and 4, the rates of both male and female unemployment have both declined, so this largely reflects diverging trends in inactivity. While the female inactivity rate has fallen, the male inactivity rate has shown a consistent upward trend. This rise in male inactivity has been large enough to raise the share of men in non-employment by around 5 percentage points since the mid-1980s to over 40%.

Inactivity trends

As highlighted by a number of authors (see eg Gregg and Wadsworth (1999) and Nickell (2001)), the rise in male inactivity since the mid-1980s has coincided with a similar rise in men reporting long-term sickness or disability (see Chart 5). From a little under 40% in 1986, the proportion of inactive men citing sickness and disability rose to a peak of nearly 60% in 1998, from which it has declined only slightly, despite a large expansion in employment. This rise has been concentrated among low-skilled, older men (see below). Perhaps surprisingly, the rise in inactivity has very little to do with early retirement. Among the 'other reasons' cited for inactivity (shown in Chart 5), the main downward influence has come from the proportion of those who believed no job was available-which fell from 14% in 1984 to 1% in 2002.

The breakdown of inactivity by reason (see Chart 6) suggests that the main downward trend for women since the mid-1980s has come from those reporting that they are 'looking after family/home', which has fallen fairly steadily over the period from nearly 70% in 1984 to 55% in 2002. But, interestingly, the percentage citing sickness or disability has also increased among women, rising from just under 9% in 1984 to nearly 25% in 2002. The main driver of the downward trend in the 'other reasons' category for women (shown in Chart 6) is

the proportion of those who 'do not want/need employment', which fell from 11% of total inactivity to 3% between 1984 and 2002.

Age breakdown

There has been little change in relative age-related unemployment rates since 1984 (see Chart 7). Youth unemployment rates remain much higher than those for the prime age groups. Indeed, comparing 1990 and 2001 (the two troughs), the difference between the rate for the 16–24 age group and that for the 25–34 and the 35–44 age groups has actually increased. However, given the general ageing of the population over this period, the unemployed population has got relatively older. For example, the percentage of the unemployed who are over 45 was 24% in 2002 compared with 20% in 1984.

Among the age-related inactivity rates, the clearest developments are the downward trend among the 25–34 age group and the rise for the 16–24 age group since the beginning of the 1990s. It should be borne in mind, however, that the broad stability of age-related inactivity rates at the aggregate level conceals rising inactivity rates among men broadly offset by declining inactivity rates among women. The over-45s have the highest inactivity rate, which has remained close to, or above, 25% for most of the period since 1984. Not surprisingly, the share of the over-45s in the inactive population has also risen over the period—from 43% in 1984 to slightly over 50% in 2002—and by more than the ageing in the population as a whole.

Skills

Non-employment tends to be much higher for those with low skill levels. Charts 9 and 10 distinguish four educational groups, defined on the basis of highest attained academic qualification (or its notional vocational equivalent): degree, A Level, GCSE grade C or equivalent, and below GCSE grade C or equivalent, indicated as 'other or no qualifications' in Charts 9 and 10.⁽¹⁾ Male inactivity rates across each of these educational groups have all risen over the period, with much the largest rise among the low skilled (those with less than the GCSE qualification), where rates have risen by nearly 10 percentage points since the end of the 1980s to 23% (see Chart 9). Despite this upward trend, the share of the low skilled in total inactivity has declined, reflecting the general rise in educational

⁽¹⁾ See Annex A for more detail. For the remainder of this article, the two lowest skill levels will be referred to as GCSE and below GCSE.

Chart 1

Non-employment, unemployment and inactivity rates



Chart 3 Non-employment, unemployment and inactivity rates: men





Chart 2 Inactivity share of non-employment



Chart 4 Non-employment, unemployment and inactivity rates: women



Chart 5 Inactivity by reason: men



Chart 6 Inactivity by reason: women



Chart 7 Unemployment rates by age



Chart 8 Inactivity rates by age



Chart 9 Inactivity rates by educational attainment: men



Chart 11 Unemployment rates by educational attainment: men



Chart 10 Inactivity rates by educational attainment: women



Chart 12 Unemployment rates by educational attainment: women



attainment in the population. In contrast, inactivity rates by educational qualification for women have all fallen, with the single exception of the low-skilled group where they have also shown a rise, albeit a much smaller one than for men (see Chart 10).

Breaking down male unemployment by educational attainment in the same way shows that the unemployment rate for those without GCSE qualifications has fallen by far the most over the period (see Chart 11). This does not mean that this group explains the fall in the male unemployment rate at the aggregate level, because there has been a large compositional shift in educational qualifications since the mid-1980s towards the higher-educated groups who have lower unemployment rates. By contrast, female unemployment rates by educational qualification have all fallen by broadly similar amounts over the period (see Chart 12).

Charts 13 and 14 provide a convenient summary of some of the key trends brought out in this section. Overall, the pool of non-employed workers has become increasingly male, older (especially among the inactive) and better qualified since the mid-1980s.

How do the working and non-working populations compare?

The question we ask in this section is whether the employed and non-employed working-age non-student populations have become more or less alike since the mid-1980s. If they have become less similar over time, a given pool of non-employed might represent a lower level of potential labour supply.

Chart 13

Unemployment composition—percentage shares of 45+, those with no qualifications, and males



Chart 14

Inactivity composition—percentage shares of 45+, those with no qualifications, and males



Gender

As we have already seen, the proportion of men among the non-employed has increased, so it is hardly surprising that, as Charts 15 and 16 show, the male share in total employment has fallen (the gender ratio in the population of working age has shown little change since 1984). This reflects the large rise in the participation rate of women in the labour market, as well as the smaller decline in male participation. These developments have helped to narrow the gender differences in employment and non-employment, though substantial differences remain—in 2002 the employment rate for men was some 10 percentage points higher than for women compared with 20 percentage points higher in 1984.

Age

Given the increase in the average age of the population over the past two decades, the employed and non-employed have also both increased in average age since the mid-1980s (see Charts 17 and 18). However, it is apparent that the non-employed population has aged rather more. Non-employment has shifted decisively towards the over-45 age group, which now forms 46% of all the non-employed, compared with 35% of the employed—a rise in the difference of around 7 percentage points since 1984.

Education

There has been a dramatic improvement in the educational attainment of both the non-employed and the employed groups, which is most evident in the

Chart 15 Gender shares of non-employment



Chart 17 Age shares of total non-employment



Chart 19 Education shares of non-employment



Chart 16 Gender shares of employment



Chart 18 Age shares of employment



Chart 20 Education shares of employment



declining share of those with less than GCSE qualifications and the rising share of those with degrees (see Charts 19 and 20).⁽¹⁾ But it is also evident that the improvement has been more marked for those in employment. Between 1984 and 2002, the percentage of low skilled in employment almost halved, to under 25%, while their percentage share in non-employment fell from two thirds to a half.

From these comparisons it seems that the non-employed have become older and less qualified relative to the employed, though the gender mix in the two states has become more similar. If older and less qualified individuals are less attached to the labour market, then these developments might imply less labour slack than otherwise.⁽²⁾

Evidence on employment transitions

An obvious way of looking at the labour force attachment of the non-employed is to look at the extent to which they subsequently move into employment. Using information from a question in the LFS which asks respondents about their labour force status twelve months before the date of the survey, it is possible to construct annual employment transition rates (ie the flow into employment from non-employment relative to the size of the non-employed population).⁽³⁾ These transition rates are shown in Table A for various categories of non-employment.⁽⁴⁾

It is clear from the table that employment transitions among the non-employed vary considerably across different demographic and education categories. For example, the average transition rate of 16–24 year olds is over three times higher than that of those aged 45–64, while those non-employed individuals who have at least an A-Level qualification are twice as likely to move to a job within a year as those without GCSEs.

Among the different non-employment states, it is not surprising that the unemployed have the highest average

Table A Transition rates from non-employment to employment

	1985	1990	1996	2002	Average 1985-2002
Male Female	0.19 0.14	0.20 0.17	0.19 0.16	0.17 0.16	0.19 0.16
16–24 25–34 35–44 45–64	0.27 0.19 0.18 0.07	$\begin{array}{c} 0.30 \\ 0.25 \\ 0.21 \\ 0.08 \end{array}$	$0.29 \\ 0.22 \\ 0.20 \\ 0.10$	0.31 0.23 0.19 0.09	0.29 0.23 0.20 0.09
Degree A Level GCSE Below GCSE	0.21 0.25 0.21 0.13	0.24 0.27 0.23 0.15	0.28 0.27 0.22 0.11	0.25 0.26 0.19 0.11	0.26 0.26 0.22 0.13
Unemployed Inactive-sick/disabled Inactive-retired Inactive-family Inactive-other reason	$\begin{array}{c} 0.31 \\ 0.02 \\ 0.01 \\ 0.11 \\ 0.18 \end{array}$	$\begin{array}{c} 0.41 \\ 0.03 \\ 0.02 \\ 0.14 \\ 0.29 \end{array}$	$\begin{array}{c} 0.36 \\ 0.06 \\ 0.03 \\ 0.11 \\ 0.39 \end{array}$	$\begin{array}{c} 0.44 \\ 0.05 \\ 0.04 \\ 0.12 \\ 0.48 \end{array}$	0.38 0.05 0.03 0.12 0.34
Memo: Inactive-students	0.35	0.41	0.35	0.36	0.37

transition rate into work. More interesting perhaps is the fact that the gap between the unemployed and those who are inactive for reasons other than sickness, looking after the family, and retirement has closed over the past two decades. On the face of it, this 'other reason' group appears to be more akin to the LFS unemployed than the other inactive categories, in terms of its transition rate into employment.

The other non-employed group whose employment transition rate is comparable to that of the unemployed is students. Up to now we have excluded students from our analysis, because the large expansion in their numbers over the period would otherwise have distorted our analysis of trends in non-employment. Given their high transition rates, students may add significantly to the pool of available labour, though it is important to note that the classification of students in the LFS data is problematic. In particular, the 'recall' question does not allow us to determine whether people who say they were full-time students a year ago were actually working or looking for work. As a result, the implied flows from 'student' to 'employment' appear to be seriously biased upwards.⁽⁵⁾

⁽¹⁾ Despite this increase in educational attainment, it has been outstripped by a rise in the demand for educated labour over the past two decades. Consequently, the skill balance has deteriorated (see Burriel-Llombart and Thomas (2001)).

⁽²⁾ Since older cohorts typically have lower educational attainment, it is possible that the relative deterioration of educational qualifications among the non-employed could have been entirely driven by the fact that the

non-employed have also become relatively older. However, this does not seem to be the case, as this deterioration has occurred in each of the four age groups we consider.(3) We use these data, rather than matched data, because they are available over a longer span of time (back to 1985,

⁽⁵⁾ We use these data, rather than matched data, because they are available over a longer span of time (back to 1985, rather than 1993). But it is important to recognise that since these transition rate data are based on the recollections of survey respondents they may be subject to recall bias (for evidence on this, see Bell and Smith (2002)). However, there is no reason to think this leads to any systematic biases in our resulting estimates of labour availability.

⁽⁴⁾ Note that our analysis of transition rates (here and in the following sections) is based on a subsample of the LFS, which we restricted to include only those individuals for whom we have information on all of our chosen characteristics.

⁽⁵⁾ A comparison of the student numbers from the recall questions with the information from actual labour market status in the same year suggests that the stock of students may be overestimated by up to 50%. One problem seems to be that many part-time students who are working classify themselves as full-time students when asked about their labour force status one year ago.

At the aggregate level (but again excluding students), Chart 21 shows that the average transition rate from unemployment into employment is much higher than the corresponding transition rate from inactivity and shows much more variation over time. However, given the much larger number of inactive people, the aggregate transition rate into employment is much more stable than the transition rate from unemployment would suggest. As Chart 22 shows, the size of employment inflows from inactivity has been broadly equal to the inflows from unemployment over 1985–2000. Indeed, since the end of the 1990s, flows from inactivity have been larger than those from

Chart 21

unemployment.



unemployment, reflecting the falling level of



Chart 22





Measures of labour availability

In this section we combine information on changes in the structure of non-employment with information on disaggregated transition rates, in order to measure overall labour force availability over the period 1984–2002.

A model-based approach

As already explained in the introduction, there are broadly two methods that have been used to measure labour availability. One approach is to use the information on transition rates to identify groups of the inactive population that appear to be similar to the unemployed, in order to generate various extended measures of unemployment. Another approach is to weight together different subcategories of the non-employed by their average transition rates, to form a fixed-weight non-employment index.

Drawing on recent research at the Bank of England (see Schweitzer (2003)), we instead focus here on a model-based measure of labour availability. This method involves estimating the probability of a non-employed individual entering employment in the next period, while controlling for their initial non-employment status (eg unemployed, looking after the family, retired) and other individual characteristics, including age, gender and education. This framework can be used to calculate the probability of each individual in the sample being in work one year later, which can serve as an indicator of their labour market attachment. By aggregating these probabilities, we can then derive a measure of the labour market attachment of the non-employed population as a whole.

Of course, whether or not a given individual does in fact move out of non-employment will depend on cyclical influences, as well as a range of unobserved idiosyncratic factors such as the motivation to seek work. By estimating the model over a reasonably long time period we hope that any cyclical factors will average out. Provided any unobserved individual factors are offsetting, our estimates should be unbiased.

One of the key advantages of this approach is that it is possible to test which indicators of labour force status and other characteristics are most important in explaining transitions into employment. If the structure of the inactive population matters for potential labour supply, then including controls for different types of inactivity should improve the fit of the model. Allowing for demographic factors also controls for the changing gender, age and skill structure of the non-working population. Schweitzer (2003) estimates models of this kind using the longitudinal version of the LFS data set, which contains detailed matched individual data for consecutive quarters. His results suggest that models based on a straightforward unemployment/inactivity distinction are inferior to those that explicitly allow for the reasons for inactivity, highlighting the important differences in labour market attachment among the inactive. He shows that those models that ignore the transitions made by the inactive predict a sharp decline in labour availability over the 1990s, in line with the fall in unemployment, while allowing for differences in inactivity suggests a smaller decline. The implication is that available labour supply has not fallen as sharply as unemployment alone would suggest.

While the longitudinal data used by Schweitzer (2003) have many advantages, these data are only available back to Spring 1993. In order to look at labour availability back to the mid-1980s, we have applied the same approach to the available annual recall data. Extending the analysis in this way imposes some limitations on the model, in that we have a more restricted data set of individual characteristics: the form of some of the questions asked in the LFS has changed over time. Nevertheless, the available data allow us to include up to six non-employed states in our model of individual employment transitions, as well as dummy variables for gender, age and education. The six non-employed states allow us to distinguish whether the individual is unemployed, sick/disabled, looking after family, retired, student or other inactive. Given the problems with the student transition data already mentioned in the fourth section above, we experimented with models which both included and excluded this category. On the whole, the models produced broadly similar predictions, but for completeness we show both below. As a benchmark, we also estimated a model on the same data, with all the same demographic and education controls, but including only unemployment as a measure of labour market status.

Empirical results

The full estimation results from the inactivity-reasons model (including students) and the unemployment benchmark model are shown in Annex B. The unemployment model implies that the unemployed have higher transition rates than the 'inactive' category. The other parameter estimates are generally consistent with the analysis in the fourth section. In particular, men and older workers have significantly lower average transition rates than women and the youngest age group respectively, while higher educational attainment is associated with higher transitions. However, conventional indicators show that the inactivity reasons model fits the data better.

Chart 23 plots the predicted transition rate from the two inactivity reasons models (with and without students). The variant that includes students shows a higher predicted employment transition rate throughout the sample period, but otherwise movements in the two models follow each other quite closely, with the exception that the students model indicates a smaller decline in availability since the end of the 1990s. Chart 24 scales the stock of non-employment by the predicted transition rates from the two models to produce two indices of overall labour availability. For comparison, these measures are plotted against an index of unemployment. As might have been expected, labour availability implied by the inactivity reasons models has declined by much less over the 1990s than movements in unemployment would imply. However, the key point to emphasise from the comparisons with unemployment is that labour availability is—according to the model measures—currently little different from the previous trough in availability in 1990. This is obviously a very different picture from that suggested by unemployment, and one that seems much easier to reconcile with the subdued pattern of wage inflation over the 1990s noted in the introduction.⁽¹⁾





(1) Of course, it need not follow that this explains the puzzle mentioned in the introduction, since we have not addressed the issue of determining the equilibrium level of labour availability. For an attempt to test the inflation-forecasting properties of various labour market tightness indicators, see Cassino and Joyce (2003).

Chart 24 Labour availability measures



Conclusions

Most commentary on the labour market tends to focus on the unemployment rate as being the most relevant criterion to judge the degree of imbalance, or 'tightness', in the market. This ignores the large contribution to effective labour supply of those classified as inactive in

Non-employment and labour availability

the labour market statistics. This article shows how misleading this may be.

Since the mid-1980s the rate of non-employment has shown a clear downward trend, mainly driven by falls in unemployment. At the same time, the non-employed population has become older and less well-qualified relative to those in work. However, at the aggregate level, transition rates from non-employment into employment have shown no clear trend over time.

Drawing on recent research at the Bank by Schweitzer (2003), we show that it is possible to generate a measure of labour availability by modelling individual employment transitions. Measures of availability generated using this method suggest that the inactive population has played an important role in adding to effective labour supply since the mid-1980s; and that overall availability is currently little different from the previous cyclical peak in the market, contrary to the implication of historically low levels of unemployment. The picture of labour availability trends that emerges from this analysis therefore seems easier to reconcile with the subdued pattern of wage growth over the past few years.

Annex A Education classifications

Using Labour Force Survey data, we allocated individuals into one of four skill groups based upon information on their highest formal qualification. These groups were:

Degree or equivalent: Undergraduate or higher degree, nursing or other medical qualification, high vocational qualifications (NVQ levels 4–5, HNC, HND, BTEC higher, Royal Society of Arts higher diploma, and other higher education).

A Level or equivalent: A Level, Scottish 6th year Certificate, AS Level, SCE highers, mid-vocational qualifications (NVQ level 3, GNVQ advanced, RSA advanced diploma, ONC, OND, BTEC, and SCOTVEC national).

GCSE grade C or equivalent: O Level, GCSE grade A–C and low vocational (NVQ level 2, GNVQ intermediate, RSA diploma, City & Guilds advanced & craft, BTEC/SCOTVEC general diploma, and completed apprenticeship).

Below GCSE grade C or equivalent: CSE below grade 1, GCSE below grade C, NVQ level 1, GNVQ/GSVQ foundation level, BTEC/SCOTVEC general certificate, SCOTVEC modules, RSA other qualification (including stage I–III), City & Guilds other, Youth Training certificate, other vocational qualifications, and no qualifications.

Annex B Logit estimates of non-employment to employment transitions

(standard errors in parentheses)

	Unemploy	ment model	Inactivity-reasons model		
Constant	-1.244	(0.009)	-2.910	(0.040)	
Unemployed	1.128	(0.091)	2.441	(0.039)	
Looking after family			0.886	(0.039)	
Sick/disabled			0.329	(0.041)	
Student			2.081	(0.040)	
Other reasons			2.255	(0.042)	
Male	-0.038	(0.008)	-0.177	(0.009)	
Age 25-34	-0.674	(0.009)	-0.066	(0.012)	
Age 35-44	-0.826	(0.011)	-0.123	(0.014)	
Age 45-59/64	-1.722	(0.011)	-0.834	(0.014)	
Degree	1.325	(0.012)	1.113	(0.012)	
A Level	0.440	(0.012)	0.204	(0.013)	
GCSE	0.629	(0.009)	0.565	(0.009)	
Log L	-226377.65		-219036.42		
Pseudo R ²	0.118		0.147		
Sample size	488714		488714		

The logit specification models the probability of an individual moving from non-employment into employment. It can be interpreted within a regression framework, so that a positive parameter estimate indicates that an individual with this characteristic has a higher probability of moving into employment. Pseudo R^2 is a goodness-of-fit measure, where a higher value signifies a better fit. It is constructed as 1-(Log L/LogL₀), where LogL₀ is the value of the log-likelihood when the model only contains a constant. In the unemployment model, the unemployment parameter indicates the probability of an unemployed individual moving into employment compared with an inactive person (the default category). In the inactivity-reasons model, the default category is those who have retired. The default gender, age and education categories are females, 16–24, and those with below GCSE qualifications respectively.

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The information content of regional house prices: can they be used to improve national house price forecasts?

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It is often suggested that house price movements in the South East lead, or even cause, movements in the rest of the United Kingdom. If this were the case then house price inflation in the South East would be useful when forecasting national house price inflation. There are plausible channels through which such a 'ripple effect' could operate. But tests for patterns of regional price changes consistent with the effect give mixed results. There is evidence that regional price changes were consistent with the South East playing a leading role in the late 1980s/early 1990s, but not during other periods. So it is important to understand the nature of the shock to the housing market before concluding that a given house price change in London and the South East has implications for house prices in other regions.

Introduction

House price inflation in London and the South East has outpaced that in the other regions of the United Kingdom in recent years (see Chart 1). On the basis of the Nationwide index, the ratio of house prices in London and the South East to those in the rest of the United Kingdom rose from 1.27 in 1993 Q2 to 1.86 in 2001 Q2, close to the historical high of 2.00 in 1988 Q1.⁽¹⁾ Since 2001 Q2, the rate of house price inflation in the rest of the United Kingdom has surpassed that in the South East and the ratio fell to 1.73 in 2003 Q2. But if the rate of inflation in the South East were to fall sharply, would that necessarily be a precursor to a slowdown in the rest of the United Kingdom? This is often described as a 'ripple effect': house price movements in the rest of the United Kingdom following, or perhaps being caused by, house price movements in the South East. If regional house price inflation in the United Kingdom does indeed follow such a pattern, then house price inflation in London and the South East would be useful when forecasting national house price inflation.

Chart 1 suggests that house price inflation in London and the South East may have led that in the rest of the country by, perhaps, one to two quarters in the downturns in the late 1970s and late 1980s/early 1990s. However, during the mid-1990s house price inflation in London and the South East rose above and then fell back in line with that in the rest of the United Kingdom, without any obvious ripple-out. Moreover, the most

Chart 1

House prices in London and the South East and the rest of the United Kingdom(a)





recent period of very strong house price inflation, which started in mid-2001, has been broadly based; and house price inflation in London and the South East does not appear to have led that in the rest of the country in the recent, so far relatively short, slowdown. So Chart 1 suggests that the ripple effect, if it does exist, may be a complex process.

This article considers what might explain a ripple effect, and whether there is evidence that it has in the past operated consistently enough for regional house price inflation rates to help forecast national house price inflation.

Why might there be a ripple effect?

There is ample evidence that the UK housing market is characterised by frictions such as search costs,

(1) The ODPM and Halifax indices show similar patterns.

transactions costs and incomplete information: if it were not, house prices would adjust very quickly to shocks and a ripple effect would be impossible. But what are the various channels through which price changes could ripple out from one region to another?

First, the housing market in some regions may react faster than others to a national economic shock. This could occur for a variety of reasons. Demand shocks could translate more rapidly into price increases in some regions than others because housing supply conditions are different. Households in some regions may react more rapidly to information than those in other regions. Such a difference in the regional speed of response to shocks could cause a ripple effect in the house price data even if there were no causal linkages between regions.

Second, there could be a ripple-out in prices if there were a ripple-out in the determinants of housing demand, for example incomes or employment. It is sometimes suggested that London and the South East lead the economic cycle. A rise in incomes and employment in those regions could be followed after some time by similar increases in other regions, perhaps because wealth from London and the South East is slowly dispersed to other regions. Incomes and employment would affect house prices in each region. So the ripple-out in the determinants of housing demand would also lead to a similar ripple in house prices. This channel could operate if one region consistently leads the economic cycle, or if one region were hit by a localised shock.

Third, the first and second channels could be complemented by demand-driven links between the regional housing markets—such as migration, commuting and investment flows—and by the way in which expectations of capital gains are formed. In particular, migration and investment could be characterised as homeowners in London and the South East moving to another region or buying second properties in another region following a house price rise in London. This would bid up prices in other regions directly through the increased demand; if the second homes were not rented out it would also increase prices indirectly in the other regions by reducing excess housing supply.

Workers in the United Kingdom tend to live a significant distance from their workplace, particularly homeowners living in the South East. Oswald and Benito (1999)⁽¹⁾ report that, in 1997/98, the average one-way commute to work was 33 minutes in the South East and 21 minutes in the rest of the country. 25% of graduate men in the South East spent at least two hours a day travelling to and from work, and 30% of all workers in the South East had a one-way commute of more than 45 minutes. This implies that a significant proportion of workers in London lives in a region other than London (most probably the South East, South West, East Anglia, and the East Midlands-see Cameron and Muellbauer (1998, page 8)). Consequently, a shock to the London economy, say a large number of City redundancies, could be transmitted to the housing market in neighbouring regions via this group of workers without any interregional migration or investment taking place at all. This mechanism could operate to a more limited extent in other regions of the United Kingdom.

If, finally, the South East were hit by a localised economic shock that raised housing demand and house prices in the region, expectations of house prices, and therefore capital gains, in other regions may rise in anticipation of a ripple-out in incomes and employment and of increased migration and investment flows. Indeed, if one region reacted much faster or earlier than others to a national shock, the expectations channel could cause prices to ripple out before the shock affected economic conditions (eg unemployment) in all regions. In other words, economic agents might interpret house price changes in the South East as a forward-looking indicator for house price changes in their region.⁽²⁾

Evidence

In principle, a ripple effect could originate in any region. But it is generally assumed that it begins in London and the South East. For example, Meen (1999, page 733) describes a ripple effect as 'the propensity for house prices to rise first in the south east of the country during an upswing and to gradually spread out to the rest of the country over time'. So a big hurdle for any

⁽¹⁾ The authors use data from the British Household Panel Survey.

⁽²⁾ A less rational expectations effect can also be postulated. In particular, evidence from the United Kingdom and the United States suggests that people form price expectations on the basis of past price movements (Case and Shiller (1988), Muellbauer and Murphy (1997), Shiller (1990a, 1990b)). A rise in house prices in London could cause house prices in other regions to increase through backward-looking expectations, even if people had no knowledge of the shock to the system.

explanation of the 'standard' ripple effect is to explain not just why house prices might ripple out from one region to another but also why house prices would usually change first in London and the South East.⁽¹⁾ In discussing the evidence for the various transmission channels we therefore focus on why London and the South East might lead the process.

First channel: rapid response

There are plausible reasons why the housing market in London and the South East may respond more rapidly to national economic shocks than that in other areas. First, the market in London and the South East may be more sophisticated, in the sense that information is reflected more rapidly in house prices there, and the market may be more liquid. Turnover, measured by the ratio of the number of owner-occupied property transactions to the owner-occupied housing stock, is highest in London and the South East (Chart 2) which could in turn mean that information relevant to house price prospects is reflected more quickly in prices there. But turnover does not vary much between regions and is also relatively high in the South West—so that region should also react rapidly to new information.

Chart 2

Total residential property sales of owner-occupied dwellings as a proportion of owner-occupied housing stock (average turnover 1999–2001)^(a)



⁽a) Total residential property sales of owner-occupied dwellings are calculated as total residential property sales plus the change in the stock of local authority and social housing.

This analysis of turnover is complicated by the existence of dwellings owned by local authorities and of social housing. The number of these dwellings varies a great deal between regions: from 27.7% of the housing stock in the North East to 13.6% in the South East. It is not clear how to treat such dwellings. It is possible to purchase some local authority dwellings, but they may be less representative of the wider market in a region than owner-occupied dwellings. For instance, the purchase price of such dwellings is likely to be significantly below the market price for similar dwellings (due to the discounts offered by the right-to-buy scheme). Chart 3 shows that *total* turnover as a proportion of the *total* dwelling stock varies less between regions than the ratio of owner-occupied transactions to the owner-occupied stock. Turnover in London is less remarkable on this basis, because it has the second highest number of local authority and social dwellings as a proportion of the dwelling stock (26% compared with 27.7% in the North East).

Chart 3

Total residential property sales as a proportion of total housing stock (average turnover 1999–2001)



The speed of response of prices in each region to a shock might also depend on the amount of spare housing capacity available in each region. Increased demand could lead prices to rise earlier in a region with a small number of vacant dwellings, because there would be less spare capacity in the system to soak up the increased demand. Chart 4 shows that London and the South East have a lower surplus of dwellings relative to household numbers than other regions. But while Chart 4 is suggestive of a faster response in house prices in London and the South East, it is still difficult to draw direct conclusions from it because the relationship between vacant dwellings and the speed of price response is not straightforward. In particular, in some regions households might find it more difficult to find suitable dwellings because, for instance, they may be less widely advertised. So the stock of vacant dwellings could be higher in some regions than others, for the

(1) It is worth noting that such a ripple effect requires that house prices in London and the South East react first to national shocks, not that London and the South East are more responsive than other regions to national shocks, such as a change in interest rates.



same speed of response of prices to a shock, because the equilibrium stock of vacant dwellings might also be higher in those regions. Furthermore, there might be large stocks of unhabitable houses in some regions which would not be a source of supply in the short run. The high price of houses in London and the South East increases the incentives to renovate derelict houses quickly, which might account for the relatively low level of spare capacity.

Increases in price as a result of any mismatch between demand and available supply should encourage new construction, which should over time dampen any initial price response to a change in demand. But the evidence suggests that it is more difficult to expand the housing stock quickly in the South East than in other regions due, possibly, to planning restrictions (see Meen (1996a)). So prices there may show a more persistent reaction to shocks.

These two factors—the availability of vacant dwellings, and the responsiveness of construction activity—may be important determinants of the speed at which house prices respond to economic shocks.⁽¹⁾ They may at least explain why house prices in London and the South East are more cyclical than in other regions (see Chart 5), even if they do not explain why they might lead those in other regions.

Second channel: regional leads

There are few studies of whether London and the South East consistently lead the economic cycle,⁽²⁾ and there is little support for the hypothesis that those regions have

Chart 5 Detrended nominal house prices^(a)



been subject to local economic shocks more frequently than other regions. This is not to say that London and the South East have never been hit by local economic shocks, nor that they have not on occasion led the economic cycle. Indeed, over the period covered by the Nationwide house price data, they may well have done so on at least one occasion—the late 1980s—and this needs to be borne in mind when interpreting later results. But those regions are not the only ones to have experienced shocks and it is difficult to see why they would be the only regions to be hit consistently by local economic shocks. Given the lack of evidence, we cannot, of course, rule out this channel. But it does suggest that ripple effects are probably not caused by the second transmission channel.

Third channel: migration, investment and commuting

There were four separate effects within the third channel. We discussed the evidence for the prevalence of commuting in the South East above, so we consider only the other three effects here. Migration and investment flows could aid a ripple effect by increasing housing demand in one region and reducing it in another. However, they are often rejected as a possibility because interregional migration and investment flows in the United Kingdom are weak. Charts 6 and 7 show that, while total interregional migration flows tend to move with house price inflation, the net migration inflows to each region (from all other regions in the United Kingdom) are small relative to the stock of dwellings.⁽³⁾ But that may not be a sound basis on which to reject the hypothesis, for two reasons.

⁽¹⁾ See Capozza et al (2002).

⁽²⁾ Two academic papers that partially deal with the issue, Byers (1991) and McGuinness and Sheehan (1998), do not suggest that one region leads the others.

⁽³⁾ For instance, the average annual net migration inflow (between 1975 and 2002) to the North West was 13,000 people, compared with a stock of 2.98 million dwellings in 2002.







Chart 7 Annual regional net migration inflows^(a)



(a) Excluding international migration.

First, people do not need to move for their housing demand to have an effect on prices in another region. Homeowners in a region should revise their asking prices upwards following a price shock in a neighbouring region, in the knowledge that they can achieve a higher sale price for their property because people may want to move between regions. Alternatively, small initial migration flows may be sufficient to indicate to homeowners that demand for property in their region is increasing, so they can expect to achieve a higher sale price. The same applies for investment.

Second, even if the ripple effect did exist we might not expect there to be much migration between the large regions often used in the analysis. Instead, we might expect the majority of people to move only a short distance, with few crossing the borders between regions; the benefits from moving can be expected to decrease rapidly with the distance of the move.⁽¹⁾ In this case, only those people close to the regional borders would be expected to move to another region and therefore be recorded as 'migrating'.

The evidence for the importance of the migration and investment channels is therefore difficult to assess. We cannot rule them out without significant further investigation.

Finally, there may be a direct expectations channel. This could, in principle, be examined by using the Royal Institution of Chartered Surveyors (RICS) monthly housing market survey to test whether people's expectations about house price inflation appear to be related to past house price inflation in other regions, especially the South East. Unfortunately, the available data cover only a short period, October 1998–December 2002, so we would not yet be able to generate useful results from such tests.

Summary

Unless there is an exogenous change in people's expectations of the equilibrium level of house prices, a national or local economic shock is required to start the ripple effect process. Given such a shock, there is some evidence that house price ripple effects could operate through the first channel (rapid response) but our discussion suggested that ripple effects are probably not caused by the second channel (regional leads). It is difficult to find evidence to suggest that the third channel (migration, investment and commuting) would not operate, but this analysis is not conclusive. So we now turn to testing the regional house price data directly for evidence of the existence of systematic patterns consistent with the ripple effect. Have regional house prices in fact moved in ways consistent with a ripple effect?

Tests for ripple effects

A ripple effect would result in regional house prices moving in a predictable pattern. There would be temporary changes in relative regional prices but stable long-run relative prices; and house price changes in London and the South East would consistently lead, or cause, changes in prices in the rest of the United Kingdom. A 'perfect' ripple effect would also be

⁽¹⁾ Tangible factors such as the cost of the move and the costs of search and intangible factors related to moving away from a current residence (eg familiarity with the area, with the home, memories etc) can be expected to increase with the distance of the destination from the homeowner's current home.

Table A **Regional house price causality test results**

Paper	Sample period	Data frequency	House price index (a)	Conclusion (b)
Rosenthal (1986)	1975-81	Monthly	Average price, ODPM	x
Hamnett (1988)	1969-87	Annual	Average price, ODPM (c)	V
Giussani and Hadjimatheou (1991)	1968 Q1-1988 Q4	Quarterly	Average price, ODPM	~
MacDonald and Taylor (1993)	1969 Q1-1987 Q4	Quarterly	Average price, ODPM	~
Alexander and Barrow (1994)	1968 Q2-1993 Q1	Quarterly	Average price, ODPM	~
Meen (1996b)	1969-94	Quarterly	Mix-adjusted price, ODPM	~
Munro and Tu (1996)	1969 Q1-1993 Q4	Quarterly	Average price, ODPM	~
Ashworth and Parker (1997)	1981 Q1-1992 Q4	Quarterly	Average price, ODPM	x
Meen (1999)	1973-94	Quarterly	Mix-adjusted price, ODPM	~

ODPM refers to the house price index now based on the Council of Mortgage Lenders (CML) 5% sample survey produced by the Office of the Deputy Prime Minister (ODPM). This index has, in the past, been referred to as the DETR, DTLR and Building Societies (a)

sample survey index. ✓ indicates that the evidence was found to be in favour of a ripple effect. X indicates the evidence was not in favour of a ripple effect. Hamnett (1988) did not use any tests. Instead the author analysed charts and tables of regional annual house price changes.

characterised by price changes occurring first in the South East, then in regions close to the South East, then finally in regions furthest away from the South East, rather than all regions following the South East with the same or geographically random lags.

Most available investigations base their work on standard statistical regions or government office regions, which do not represent regional housing markets particularly well. In fact, there is little reason why we would expect housing markets to be segregated according to the geographical boundaries of the standard statistical regions.⁽¹⁾ Additionally, robust regional house price data are available only at a quarterly frequency. The use of quarterly rather than monthly data could mask any patterns consistent with the ripple effect, although if the ripple effect operated so rapidly that it was undetectable with quarterly data it would not be very useful for forecasting purposes. With these problems in mind we can now assess the available evidence.

First test: econometric tests for the leading regions

Econometric methods can be used to test whether house price inflation in one region can significantly help to explain future house price inflation in other regions. For instance, we could test whether house price inflation in the South East can help explain future house price inflation in the North West. These tests are commonly

referred to as 'Granger causality' tests, although a positive result does not prove that house prices in one region cause those in another region in a structural sense. Instead it just suggests that house prices in one region contain information useful for forecasting house prices in another region (that result is consistent with causality, but does not prove its existence).

The results from a wide array of papers, most but not all of which use Granger causality tests, are summarised in Table A,⁽²⁾ and provide significant evidence in favour of the ripple effect. However, even the most recent papers do not consider price changes after 1994, so the results may be dominated by the late 1980s' experience. Moreover, Granger causality tests⁽³⁾ are sensitive to the precise specification of the test and the results may also be sensitive to changes in the sample period and house price index used.

All of the papers use either the average-price or mix-adjusted price ODPM indices.⁽⁴⁾ Assessing the tests in Table A, however, is not straightforward because the two indices can give very different estimates of house price inflation from quarter to quarter (see Chart 8). In addition, the average price may reflect changes in the mix of houses being sold while the way the mix-adjusted index is constructed means it gives more weight to price changes of expensive houses than of cheap houses (see Thwaites and Wood (2003) for more details). So it is

⁽¹⁾ Munro and Maclennan (1986) show how a regional approach ignores substantial local variation in housing market conditions and can lead to incorrect conclusions regarding price movements within the region. We can also emphasise this point by taking the West Midlands as an example. The region includes 38 local authorities encompassing the large rural counties of Herefordshire, Worcestershire, Shropshire, Staffordshire and Warwickshire and the seven metropolitan boroughs of Birmingham, Coventry, Wolverhampton, Dudley, Sandwell, Solihull and Walsall (see www.advantagewm.co.uk). Even if the ripple effect does exist it is difficult to imagine house prices in these various parts of the West Midlands moving together consistently enough to allow the so-called ripple effect to be detected from the regional house price data.

⁽²⁾ The conclusions of the papers are not just a simple yes or no and are complicated by the regions used, and by whether they are aggregated into South versus North or just use standard statistical or government office regions, so it is difficult to do them justice in a simple table. Table A is a reasonable summary of the results, but readers should consult the original papers for the detail of the conclusions and tests used.

⁽³⁾ Although the results from Granger causality tests are not used as the only evidence in the various papers, they do tend to be used more than any other type of test.

⁽⁴⁾ The average-price index is calculated from the simple average price of all dwellings in the ODPM sample. The mix-adjusted index takes some account of the changes in characteristics (such as type of dwelling and its region) in the sample each quarter. See Thwaites and Wood (2003) for more details.

Chart 8

Difference between quarterly national house price inflation measured by the mix-adjusted and average-price ODPM indices



possible that these results are being driven by changes in the mix of houses sold or by the price of expensive houses.

We have repeated the tests on the regional Nationwide, Halifax and mix-adjusted ODPM indices. We extended the sample period to 2002 Q4 and, in addition to considering the evidence over the full sample period, experimented with different specifications and with subperiods of the full sample.

In principle, the Nationwide and Halifax indices are probably more appropriate than the ODPM index when testing for ripple effects, as both aim to measure the price of a typical transacted house with a representative mix of attributes. So the effect on the index of a change in the price of a house will not depend on the value of that house (see Thwaites and Wood (2003) for more details). However, the samples used to construct these indices may not be as representative as those used for the ODPM index, which includes transactions recorded by almost all lenders, rather than just those recorded by a single lender. Additionally, the Halifax index is only available from 1983; and although the Nationwide index is available from 1973, the current hedonic regression technique has only been used to calculate the index from 1983 onwards. Prior to 1983 prices were mix-adjusted by floor space, house type and region. Nevertheless, the Halifax index now provides 20 years of data and the sample size is large. The Nationwide

index is useful for comparison although we need to keep in mind that the method has been changed since 1973.

The results of the tests, reported in Tables B, C and D, are mixed.⁽¹⁾ The tables are arranged such that, in general, 'South to North' relationships are recorded above the diagonal and 'North to South' relationships are recorded below the diagonal. The tests on the Nationwide and ODPM indices give more evidence of South to North causality than North to South but the result is not clear-cut. There are 48 and 46 highly significant (significant at the 0.1% level) relationships above the diagonal in Tables B and C respectively, but there are five and seven below the diagonal in Tables B and C respectively. The Halifax index gives significant evidence of North to South as well as South to North causality. There are 34 highly significant relationships above the diagonal in Table D and 15 below it. These pictures become less clear-cut if we also consider less significant relationships: for instance, if we also consider relationships significant at the 1% level.

Further tests, not presented here, show that the results for all indices are sensitive to the time period used: there is evidence for the ripple effect in the 1984–93 period, but there is little evidence for the periods 1973–83 and 1994–2002.

The existence of significant North to South and two-way relationships is not necessarily inconsistent with the ripple effect from the South East outwards that we have in mind. For instance, high house price inflation in Wales appearing to cause low house price inflation in the South East might occur because price changes take some time to ripple out to Wales. By the time a rise in prices in the South East causes rises in Wales, the South East may be experiencing a slowdown in house price inflation.

Second test: does regional house price inflation have explanatory power in a national house price equation?

We can also test whether past values of a particular region's house price inflation contain information useful for explaining current values of national house price inflation. We have carried out such a test by estimating

⁽¹⁾ The tests for causal relationships were carried out using four lags of the deviation of the natural log of seasonally adjusted regional house prices from their time trend. For such tests to be valid the series must be trend stationary processes (TSP). Augmented Dickey Fuller (ADF) tests strongly suggest the series are in fact difference stationary processes (DSP). But in principle the series should be TSP and these ADF tests have low power, so they will find it difficult to reject the hypothesis of a unit root. Nevertheless, to ensure the results presented are valid we also ran the Granger causality tests using the first difference of logged regional house prices. Such tests would be valid if the series were DSP. The results were very similar to those presented in the main text, suggesting that our assumption that house prices are TSP was not invalid, or at least was unimportant in these circumstances.

Table BGranger causality test statistics for relationship in house prices between pairs of regions(a)using the Nationwide index for 1973 Q4–2002 Q4

						То							
From	GL	OM	OSE	EA	SW	EM	WM	W	Y&H	NW	N	Scot	NI
GL	-	*	*	**	**	**	**	*	**	*	*	-	*
OM	**	-	**	**	**	**	**	**	**	**	**	-	**
OSE	**	*	-	**	**	**	**	**	**	**	**	*	**
EA	-	*	*	-	**	**	**	**	**	**	**	*	**
SW	**	**	**	**	-	**	**	**	**	**	**	**	*
EM	-	**	**	-	*	-	**	**	**	**	**	**	*
WM	*	*	**	*	*	**	-	**	**	**	**	*	*
W	-	*	*	**	*	-	-	-	**	**	**	**	*
Y&H	*	*	**	*	-	*	-	**	-	**	**	**	**
NW	-	*	*	-	-	-	-	-	-	-	**	**	**
Ν	_	-	-	-	-	_	-	_	-	_	_	-	**
Scot	_	-	-	-	*	_	_	_	-	_	_	-	**
NI	-	-	*	-	-	-	_	_	*	**	-	-	-

(a) Light orange shading denotes significance at the 5% level, medium orange shading denotes significance at the 1% level, dark orange shading denotes significance at the 0.1% level.

Table CGranger causality test statistics for relationship in house prices between pairs of regions(a)using the ODPM index for 1968 Q2-2003 Q1

	То											
From	GL	SE	EA	SW	EM	WM	W	Y&H	NW	N	Scot	NI
GL	-	*	**	**	**	**	**	**	**	**	**	*
SE	**	-	**	**	**	**	**	**	**	**	*	-
EA	-	-	-	**	**	**	**	**	**	**	-	-
SW	**	**	**	-	**	**	**	**	**	**	*	-
EM	**	*	*	-	-	**	**	**	**	**	**	-
WM	-	*	**	*	**	-	**	**	**	**	**	-
W	-	-	-	-	**	**	-	**	**	**	**	-
Y&H	-	-	-	-	-	*	**	-	-	**	**	-
NW	-	-	-	-	-	*	**	**	-	**	**	-
Ν	-	-	-	-	-	-	-	**	*	-	*	*
Scot	-	-	-	-	-	*	-	**	-	-	-	*
NI	_	-	_	-	-	*	**	-	_	-	_	_

(a) Light orange shading denotes significance at the 5% level, medium orange shading denotes significance at the 1% level, dark orange shading denotes significance at the 0.1% level.

Table D

Granger causality test statistics for relationship in house prices between pairs of regions^(a) using the Halifax index for 1983 Q1-2002 Q4

	То											
From	GL	SE	EA	SW	EM	WM	W	Y&H	NW	N	Scot	NI
GL	-	**	**	**	*	*	*	*	-	*	-	-
SE	**	-	**	**	**	**	*	**	**	*	-	-
EA	*	**	-	**	**	**	**	**	**	**	*	-
SW	**	**	*	-	**	**	**	**	**	**	*	-
EM	**	**	**	*	-	*	**	**	**	**	**	-
WM	**	**	**	**	**	-	**	**	**	**	**	*
W	**	**	**	**	**	-	-	**	**	**	**	-
Y&H	**	**	**	**	*	-	**	-	**	**	**	-
NW	**	**	**	**	-	-	-	-	-	**	**	*
Ν	**	**	*	*	-	-	-	-	-	-	**	-
Scot	**	**	**	*	-	-	-	-	-	-	-	**
NI	**	-	*	-	-	-	-	-	-	-	-	-

(a) Light orange shading denotes significance at the 5% level, medium orange shading denotes significance at the 1% level, dark orange shading denotes significance at the 0.1% level.

Note: GL = London; OM = Outer Metropolitan; OSE = Outer South East; SE = South East; EA = East Anglia; SW = South West; EM = East Midlands; WM = West Midlands; W = Wales; Y&H = Yorkshire and Humberside; NW = North West; N = North; Scot = Scotland; NI = Northern Ireland.

variants of a simple house price equation. In this equation house prices are determined by average earnings and the real interest rate in the long run, but earnings growth and the lagged value of house price inflation help explain the short-run movements around the long-run equilibrium. To perform this test we added lagged values of a region's house price inflation rate to the short-run dynamics of house prices, and tested the significance of those variables.⁽¹⁾

Five regions were tested: London, the South East, East Anglia, the East Midlands and the North West. The results are presented in Table E and do not give strong evidence in favour of house price inflation in any region containing information that is useful for forecasting national house price inflation. There is some evidence that the South East and East Anglia may be leading regions, but only using the Halifax index and not for the second half of the sample. This is consistent with Chart 1 (which indicates that London and the South East only led the rest of the United Kingdom during the late 1980s) and the Granger causality tests.

There are some statistical problems with the equations used in Table E because the regional house price inflation terms are highly correlated with each other and with the lagged national house price inflation term. So it is difficult to isolate the explanatory power of any individual variable. We addressed this problem by estimating further variants of the equations,⁽²⁾ but the results were almost identical to those shown in Table E.

Table E

Collective significance of lagged regional house price inflation terms (Halifax/Nationwide) in national house price equation^(a)

Period	GL	SE (b)	Outer Met (b)	EA	EM	NW
1984 Q2-2003 Q1 1984 Q2-1993 Q4	X / X X / X	<pre>/ X</pre> / X/ X	-/X -/X	<pre> // / / X / X / X / X / X / X / X / X /</pre>	X / X X / X	x / x x / x

(a) \checkmark indicates the terms were significant at the 5% level, X indicates the terms were not significant at the 5% level.

(b) SE refers to the Halifax South East region but the Nationwide Outer South East Region.

Conclusions

A pattern of regional house price changes consistent with the so-called ripple effect has to be caused by a shock to the economy. In the past, the shock has often been a large rise in interest rates and unemployment. Following such a shock, there are three main channels through which a ripple effect could operate. Plausible arguments and supporting evidence can be advanced in favour of London and the South East reacting faster than other regions to economic shocks, and expectations, migration, investment flows and commuting could also have an effect. However, there is no evidence that a shock to the economy would always cause house prices to rise first in London and the South East, or that house prices are always consistently transmitted between regions via this channel.

We have used various tests to identify whether regional house prices have in the past moved in a way consistent with ripple effects. The results are mixed. There is more evidence of South to North than North to South causality, but the results are sensitive to the house price index and time period used. There appears to be little evidence of ripple effects operating post-1994, but significantly more evidence for the pre-1994 period. The sharp fall in house price inflation in the late 1980s and early 1990s was associated with a large increase in interest rates and unemployment that may have affected the housing market in London and the South East more quickly than other regions. This may explain why London and the South East appear to have led national house price inflation in the late 1980s.

So a ripple effect could, in principle, exist and there are plausible channels through which it could operate. But it is important to understand the nature of the shock that would be causing a ripple effect, before concluding that a given house price change in London and the South East has implications for house prices in other regions. House price changes could simply reflect local conditions and may not have any significant implications for other regions.

(1) The following equation was estimated for each region i:

 $\Delta h_{t} = c + \beta_{1} \Delta h_{t-1} + \beta_{2} \Delta earnings_{t-1} + \beta_{3} (h_{t-1} - earnings_{t-1} + \beta_{4} RLR_{t-1}) + \beta_{5} \Delta h_{t-1} + \beta_{6} \Delta h_{t-2} + \beta_{7} \Delta h_{t-3} + \beta_{8} \Delta h_{t-4}^{i}$ where all variables apart from *RLR* are in logs, *t* represents the time period, *c* is a constant, *hn* is the average of the Halifax and Nationwide national house price indices, *earnings* is the average earnings index, *RLR* represents the real long-run interest rate and is defined as the ten-year index-linked bond yield, and *hp* is the regional house price index that the test is being conducted on. We tested, separately on Nationwide and Halifax regional indices, whether $\beta_{5} = \beta_{6} = \beta_{7} = \beta_{8} = 0$.

(2) For example, one of the variants included only the second and fourth lags of the regional house price inflation rate.

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Balance sheet adjustment by UK companies

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Corporate debt levels in the United Kingdom are currently at an historically high level in relation to the market value of corporate capital. Empirical evidence discussed in this article suggests that this is unlikely to be an equilibrium position and that companies will continue to act so as to strengthen their balance sheets. Much of this adjustment is likely to occur through financial channels, such as reduced dividend payments or increased new equity issues, but it could also occur through more restrained capital investment. Illustrative simulations presented in the article suggest that adjustment tends to be gradual and that it may take several years for balance sheets to return to equilibrium.

Introduction

The balance sheet position of non-financial companies goes through phases of strength and weakness. At present, the amount of corporate debt is at an historically high level in relation to the market value of the capital that ultimately provides the means by which the debt will be serviced. Past patterns would suggest that high gearing levels will not persist without companies acting to bring down their indebtedness. But the speed and means of any such adjustment could have important implications for financial and monetary stability.

From a financial stability perspective, the current high levels of debt, if allowed to persist, might leave companies vulnerable to shocks that could affect their ability to service their debts in the future and so risk their continued existence. But, at the other extreme, if the repayment of debt required a further sharp cut-back in corporate spending, that would affect the outlook for the economy as a whole, including the inflation target. Assessing the likelihood of these and other possible outcomes requires an understanding of what lies behind the build-up of corporate debt and how companies typically adjust their balance sheets.

This article addresses these issues by asking what determines the level of gearing that companies appear to aim for over time and whether this is likely to have changed recently. This provides some guidance as to whether gearing is currently excessive and in need of adjustment. It then discusses some recent evidence on how companies adjust their balance sheets in practice and assesses the likely path of adjustment. The overall conclusion is that balance sheet adjustment is likely to be gradual and achieved mainly by companies retaining more profits than by further sharp cut-backs in capital spending.

Equilibrium gearing and the need for adjustment

The amount borrowed by companies reflects their financing decisions over a number of years.⁽¹⁾ While they may have limited scope to make changes from year to year, in the long run companies have considerable discretion over their borrowing. Most companies that wished to reduce their indebtedness could do so over a period of years by retaining more profits at the cost of dividend distribution and by issuing new equity from time to time. Once debt began to fall, interest payments would also be reduced, making further debt reductions easier to achieve for a given level of profits. But debt may be more difficult to reduce for companies whose interest payments are large in relation to their profits and if market conditions make it difficult to raise equity finance. Failure to adjust debt quickly then makes the process of adjustment more difficult as extra interest payments add to the burden. Once insolvency is threatened, the cost of debt to the company is more than the simple interest charge and would include the

⁽¹⁾ Unless otherwise stated, we assume that company decisions are made by the management on behalf of the shareholders. In practice, decisions about how much debt to hold are usually taken by management subject to the approval of shareholders, who have the power to remove management if they are not happy with its choices.

direct costs of re-organisation in the event of insolvency as well as the indirect costs that arise when companies get into financial difficulty (Barclay *et al* (1995), Myers (2001)).

What are the attractions of debt that tempt companies to borrow to the extent that they risk financial distress? For some companies, it may be that debt appears cheaper than equity in that the interest rate on debt is usually less than the cost of equity finance. They might try to exploit this difference by substituting debt for equity. But the famous Modigliani-Miller theorem (Modigliani and Miller (1958)) shows that this strategy will not generally be successful. Substituting debt for equity in this way makes the remaining equity even riskier and the resulting higher cost of equity finance offsets exactly any benefit of having more debt. In essence, a company is valued on the basis of the income stream it generates and there is no obvious reason why it should be valued differently when it repackages that income stream into separate debt and equity streams unless this changes the value of the income stream itself.

The importance of the Modigliani-Miller theorem, as Miller himself emphasised, is that 'showing what does not matter helps to draw attention to what does'. The academic literature draws attention to four main factors that make debt an attractive method of business finance.⁽¹⁾ First, debt is encouraged by differences in the rate at which income is taxed at the corporate and shareholder level, partly due to the tax deductibility of corporate interest payments (Auerbach (2002)). This is discussed further below. Second, asymmetries in information between the managers of companies and outside investors also tend to encourage debt issuance. Such information asymmetries are more acute for equity investors whose returns depend on the performance of the company than for debt providers whose returns are usually clearly specified in advance. The possibility that managers might take advantage of their better knowledge about the true state of their business when selling equity might cause investors to wonder whether it is as valuable as is claimed. This leads investors to undervalue new equity issues, enhancing the attractiveness of debt relative to equity finance (Myers and Majluf (1984)). Third, in the absence of debt companies would generate larger amounts of cash that could be disposed of at the discretion of managers. Shareholders might worry that managers would use this to consume 'perks' rather than to benefit shareholders.

As such, one of the advantages of debt is that it limits the free cash flow available to managers (Jensen and Meckling (1976)). Fourth, debt is preferred by entrepreneurs who do not wish their control rights to be diluted, as would be the case with equity issues (Hart (2001)).

If there were only benefits to holding debt and no costs relative to equity this would imply all firms hold 100% debt and no equity. However, increasing debt also raises the expected costs of financial distress. These depend on both the probability that a firm will suffer distress, and the magnitude of the costs should the firm suffer distress. Under the so-called 'trade-off' model of gearing, firms are assumed to trade off the advantages of debt against the expected costs of financial distress (Barclay et al (1995), Myers (2001)). As firms borrow more, the benefits of debt increase, but the expected costs of distress also rise as the probability of bankruptcy rises. The 'trade-off' model implies that there will be an equilibrium level of debt where any further increase in indebtedness will raise the expected costs of distress by more than the additional benefit of that extra borrowing. Not all theories in the literature are consistent with the concept of an equilibrium level of debt. For example, the 'pecking order' theory of Myers and Majluf (1984) asserts that borrowing is always preferred to new equity issues because all other costs and benefits of holding debt are second order in relation to the effects of asymmetric information on the terms and conditions of equity finance. Therefore, 'changes in debt ratios are driven by the need for external funds, not by any attempt to reach an optimal capital structure' (Shyam-Sunder and Myers (1999)).

These different theories all throw some light on the factors that lie behind the balance sheet choices of companies, but it is not clear how they can be combined into a single model that offers an empirical explanation of changes in gearing over time. Indeed, Myers (2001) has suggested that 'there is no universal theory of the debt-equity choice, and no reason to expect one'. It is even less likely then that a complete empirical model of gearing could be constructed. Partly this reflects the difficulty in quantifying the effects of factors like asymmetric information and the need to discipline managers. Despite much progress theoretically, Rajan and Zingales (1995) claim that 'very little is known about the empirical relevance of the different theories'.

⁽¹⁾ A recent survey of this literature is Myers (2001).

Our approach is to develop an empirical model of corporate debt choices based on what is readily quantifiable. We make use of the 'trade-off' theory of gearing described above in which firms trade off the tax benefits of debt against the expected costs of financial distress to determine their equilibrium level of gearing. Quantifying the tax benefits is not straightforward. Our estimate is an update of the measure derived by Young (1996); and is shown in Chart $1.^{(1)}$ This measure of the tax advantage of holding debt depends on corporate and personal tax rates and is weighted by the proportion of equity held by individuals and pension funds, taking into account the different tax treatment of these two groups. It shows the overall financial benefit to shareholders of an additional unit of corporate debt, taking into account the other financial opportunities open to shareholders. A positive value for the tax gains to gearing implies that it is more efficient for the firm to borrow than for the shareholders to borrow and supply equity capital to the firm.

Chart 1 Tax gains to corporate gearing



The intuition behind our measure of the tax advantage of debt is as follows. The tax deductibility of interest payments implies that by borrowing more a firm will increase its interest payments and reduce its tax liability. A firm can use the proceeds of its additional borrowing to pay out a higher dividend in the current period at the expense of a lower dividend in the next period. Shareholders can then invest the additional proceeds of the higher initial dividend and earn a return on their investment. The benefits to shareholders may be eroded

$$GAINL_{t} = \sum_{m} w_{mt} \left(\frac{(1 - \tau_{t}^{m})}{(1 - s_{t}^{m})} r_{t} - (1 - \tau_{t}) r_{t} - \frac{g_{t}^{m}}{(1 - g_{t}^{m})} \pi_{t}^{*} d_{t} \right)$$

once personal taxes are taken into account; this depends on the relative tax rates on dividend income and capital gains. The rate of capital gains tax is important because the value of equity will fall when more debt is issued, leading to a reduction in shareholders' capital gains tax liability. Thus, corporate borrowing to fund higher dividend payments would not be welcomed by investors with high marginal rates of income tax; they would prefer to accumulate money within the company and be taxed at a lower capital gains rate. By contrast, tax-exempt investors such as pension funds would always tend to benefit from the tax saving of corporate borrowing. This suggests that, other things being equal, the tax gains to corporate gearing will be higher the lower is the personal tax rate relative to the capital gains tax rate. They will also be higher, the higher is the corporation tax rate, since then there will tend to be more company tax payments against which interest can be deducted.

Our measure shows that on tax grounds there have been positive benefits to corporate borrowing throughout the period from 1970. The size of the gain has varied substantially over time as corporate and personal tax rates have changed. There were significant increases in the tax benefits of gearing over the 1970s as corporation tax rates rose. There was then a fall throughout the 1980s as corporation tax rates fell. Since the mid-1990s the estimated tax gains to gearing have been at an historically low level.

Equilibrium gearing

We now develop an empirical model of gearing that follows and updates the approach of Young (1996). A dynamic model of corporate net debt is estimated as a function of the market value of the assets of the corporate sector and the tax gains to corporate gearing. The model is limited to the extent that it focuses solely on the tax benefits of gearing; other less quantifiable factors that are likely to be important in the gearing decision, such as the costs of financial distress, are assumed not to vary over time. The wide historical variation in corporate and personal tax rates over time in the United Kingdom makes it possible to assess whether changes in the tax benefits to corporate debt have

where t indicates the time period, m denotes individuals or pension funds, r is the interest rate, w_m is the weight of investor m, τ^m is the income tax rate paid by m, g^m is the capital gains rate paid by m, τ is the corporate tax rate, π^* is expected inflation and d takes the value of one when the capital gains system is indexed and is zero otherwise. If this expression is multiplied by 400 we can interpret the tax gains to gearing in terms of the annualised interest rate at which firms can borrow (as in Chart 1).

⁽¹⁾ The expression measuring the tax gains to gearing is:

caused companies to vary their desired level of gearing. But in practice, as noted above, those decisions will also be influenced by movements in the less quantifiable factors affecting the risks and costs of insolvency.

Our analysis defines PNFC capital gearing as net debt in relation to the market value of the corporate sector. Net debt is defined as the sum of all outstanding bank borrowing and securities other than shares minus currency and deposits. We measure debt in relation to the market valuation of the PNFC sector since the market value should be equal to the expected present value of all future cash flows from which the debt must eventually be repaid. This is likely to be a good measure of the borrowing capacity of PNFCs. Gearing can also be measured in relation to capital at replacement cost, but we focus on the market value measure since it is quicker to respond to market developments and because the capital stock is notoriously difficult to measure.

In the estimated model (see appendix), actual gearing adjusts gradually to a long-run solution that is determined by the tax gains to gearing, which are statistically significant at the 1% level. The long-run solution to the equation is interpreted as equilibrium gearing. Chart 2 compares the actual level of capital gearing at market value with the long-run equilibrium level implied by the estimated model. Chart 3 shows the difference between these two series; our measure of balance sheet disequilibrium. As might be expected, the equilibrium level of capital gearing at market value implied by our model has remained more stable than the actual level, reflecting the greater frequency of shocks to the latter. Most of the variation in equilibrium gearing occurred during the 1970s and early 1980s with the peak being reached in 1980. The long-run equilibrium level of gearing fell for most of the 1980s, as corporate tax rates were reduced from the high levels of the 1970s. There has been little variation in the 1990s.

Disequilibrium gearing

The actual level of gearing can move away from equilibrium in response to the changing circumstances that companies face, including the arrival of investment or merger and acquisition opportunities as well as changes in cash flow. Companies may allow borrowing to rise in the short term in each case with the intention of reducing it in the longer term as, for example, investment opportunities pay off. There may also be unexpected shifts in the market valuation of companies that move the actual level of gearing away from

Chart 2 Actual level and implied equilibrium of PNFC capital gearing at market value



Chart 3 Difference between actual gearing and implied equilibrium gearing



equilibrium. For example, an unexpected decline in the stock market would reduce market values and increase gearing.

There have been four episodes in the past 30 years when observed gearing has diverged persistently from our estimate of equilibrium gearing. The first of these was in 1974 when severe stock market weakness reduced the market value of companies relative to their net debt and thus raised measured gearing to substantially above the equilibrium implied by our model. This disequilibrium was largely eliminated by a market recovery. The second period of disequilibrium was in the mid-1980s when corporate gearing fell below the estimated equilibrium level. This was more than reversed by a sharp increase in corporate debt in the late 1980s and early 1990s. According to these estimates, companies spent most of the 1990s gradually adjusting their balance sheets back to equilibrium. The fourth period of disequilibrium is the current one, where the increase in indebtedness

since 1998, combined with falls in the market valuation of the corporate sector since the beginning of 2000, has resulted in capital gearing at market value increasing to a level well above the equilibrium implied by our model.

Possible means of adjustment and evidence

The historical pattern of the emergence and then correction of balance sheet disequilibria suggests that companies are now likely to be considering ways of reducing their indebtedness. In some cases the urgency of the need for adjustment may be more apparent to lenders, market commentators and rating agencies than to highly indebted companies themselves. Such external pressure, for example a ratings downgrade and higher borrowing costs, may force companies to take corrective measures. In other cases, companies may adjust balance sheets pre-emptively and voluntarily before external pressures build up. There are a number of possible channels through which balance sheet adjustment may take place; these include both real and financial changes. Real adjustment can take the form of a run-down in inventories, cut-backs in capital expenditure or reductions in labour input.⁽¹⁾ Financial adjustment involves changes in dividend policy, increases in equity finance or a refinancing of debt.

Whether real or financial adjustment is undertaken, it is unlikely to be costless. Cut-backs in capital spending may have adverse implications for the long-run profitability of firms, if they mean that productivity-enhancing investment projects are not undertaken. As for changes in dividend policy, Lintner (1956) argued that firms seek to avoid reducing dividends wherever possible. In the presence of asymmetric information any reduction in dividends may act as a negative signal to the markets that future cash flow may be lower than expected; and consequently there could be an adverse impact on the share price of that firm.

Recent research at the Bank has investigated the impact of financial factors on company-level capital investment, dividend payments and new share issues. Benito and Young (2001) explore the reasons for an increase in the proportion of companies omitting or cutting their dividend payments in recent years.⁽²⁾ They find that high gearing is one of the key factors explaining the increased propensity for companies to omit or cut their dividend. Benito and Young (2002) discover an interesting contrast in the effect of different financial indicators on firm behaviour. In particular, they find that dividend payments and the propensity to issue new shares are affected by the stock of debt relative to the value of capital, whereas capital investment is more affected by a flow measure of financial pressure, the ratio of interest payments to profits. This suggests that companies would mainly tend to adjust their balance sheets by financial means except when there is substantial pressure on their cash flow, when they also cut back their capital spending.

Similar relationships can be estimated at the aggregate level. In the appendix, we list aggregate relationships linking dividend payments, net equity finance and capital investment to balance sheet disequilibrium. We find statistically significant effects of disequilibrium gearing on dividend payments and new share issues, with a much weaker effect on capital investment, consistent with the company-level evidence. The quantitative impact of disequilibrium gearing is estimated to be substantial. The long-run response of dividends and net equity finance to an increase in the gap between actual gearing and the equilibrium level implied by our model is larger and quicker than the response of investment. The slower response of investment is consistent with the notion that real adjustment only takes place once constraints on financial variables start to bind.

Likely path of adjustment

If there is a need for adjustment, a key question is how quickly balance sheets will return to equilibrium. Even though companies may respond quickly to the disequilibrium, the process of balance sheet adjustment is likely to be protracted simply because the flows of dividends and investment are small in relation to the stock of debt. To illustrate this point, in 2003 Q1 the flow of PNFCs' dividends accounted for 4.7% of their net debt. The corresponding figure for business investment was 8%. This suggests that sustained adjustment to these flows over a period of time is required to eliminate large gaps between the actual level of gearing and the equilibrium implied by our model.

The speed of adjustment is also affected by the underlying macroeconomic and financial background. If

⁽¹⁾ Using company-level data, Nickell and Nicolitsas (1999) find evidence of significant effects of financial pressure on

employment, wage growth and productivity.

⁽²⁾ See Bank of England Financial Stability Review, June 2003, page 52, for a discussion of this trend.

the performance of the economy were to deteriorate, this would probably be associated with a weakening in corporate profitability and so the funds companies have available for debt repayment would be reduced. Further, the level of interest rates also has an impact on the path of adjustment with lower interest rates facilitating more debt repayment given that what is saved in interest payments can be used to repay debt.

To illustrate how capital gearing might move back towards equilibrium and how the adjustment path is affected by macroeconomic conditions, we consider simulations of two shocks that move capital gearing away from its equilibrium position. In the first case the shock represents slower growth in world activity and trade, which adversely affects domestic demand (UK GDP declines by approximately 2% relative to base after three years), while in the second case there is an immediate unanticipated 35% fall in both world and UK equity prices. The shock to equity prices can be thought of as a downward revision to mistaken expectations about corporate earnings. This second simulation was used as part of the International Monetary Fund's recent Financial Sector Assessment Programme (see Hoggarth and Whitley (2003)). Interest rates are assumed to remain constant in response to the shocks.

The simulations use a medium-term macroeconometric model (MTMM, as described in Bank of England (2000)) and three versions of the corporate sector extension described in Benito, Whitley and Young (2001). The first version assumes no active balance sheet adjustment in the corporate sector. The second version replaces the dividends, net equity finance and investment equations with estimated equations that include balance sheet disequilibrium terms. The third version allows adjustment to take place via dividends and net equity finance but not investment. These new equations are documented in the appendix. The simulations are only illustrative. They indicate what might happen in response to a certain set of circumstances and not necessarily what would happen.

Chart 4 shows the response of capital gearing at market value to the shocks in the version of the model with all forms of balance sheet adjustment (solid line), with adjustment through dividends and net equity finance only (broken line) and without balance sheet adjustment

Chart 4 The response of capital gearing at market value^(a)



(a) Solid line represents the response using the equations that incorporate full balance sheet adjustment; the broken line does not allow investment to adjust. The dotted line shows the response using equations without the balance sheet adjustment term.

(dotted line). Both shocks lead initially to a sharp rise in gearing as lower growth and equity prices reduce corporate profitability (thereby necessitating more debt finance in the short run) and the market value of companies. In the model without balance sheet adjustment, the level of gearing shows no tendency to move back to base following the shocks. By contrast, once adjustment is allowed for, changes in dividends, investment and new issues reduce the level of borrowing relative to what it would otherwise have been so that corporate gearing returns towards its initial level.⁽¹⁾ If adjustment is not allowed to take place through investment, it still occurs but at a slower rate. The adjustment is relatively protracted in that it takes nearly five years for capital gearing to return to base, illustrating the kind of timescale involved in the process of adjustment.

The adjustment of capital gearing towards base is less rapid in the case of the world demand shock than in the case of the equity price shock. This is because profitability is more adversely affected by the former shock, so that less profit is available to repay debt compared with the equity price shock.⁽²⁾ This illustrates how the performance of the wider economy is important in determining the timescale of adjustment.

Charts 5 and 6 show that the response of dividends and business investment to the shocks is negative, but the size of the negative effect is much larger when

⁽¹⁾ Raising new equity finance may be more difficult following an equity price shock. Our equation for equity finance

does have a role for equity prices which should at least partially account for this.

⁽²⁾ GDP is one of the main determinants of corporate sector profitability in our macroeconometric model. The greater adverse effect on GDP in the demand shock explains why profitability is reduced by more in the former simulation.

Chart 5 Response of dividends to shocks(a)



(a) Solid line represents the response using the equations that incorporate balance sheet adjustment; the broken line does not allow investment to adjust. The dotted line shows the response using equations without the balance sheet adjustment term.





⁽a) Solid line represents the response using the equations that incorporate balance sheet adjustment. The dotted line shows the response using equations without the balance sheet adjustment term.

companies are also attempting to adjust their balance sheets. The response of dividends to both shocks is relatively rapid, with a peak change within a year and then a return towards base as the balance sheet disequilibrium is gradually eliminated. The dynamic response of capital investment is much slower reflecting the long lags in the estimated equation. In both percentage and absolute terms, the adjustment of dividends is larger than the adjustment to investment. The smaller and slower adjustment of investment relative to dividends reflects the likelihood that investment will only be adjusted once the financial variables such as dividends face binding constraints.⁽¹⁾ If no adjustment occurs through investment, the cuts in dividends are larger and slightly more equity finance is raised to compensate for this.

Conclusion

This article suggests that companies are not indifferent to the state of their balance sheets. Our estimates suggest that actual gearing is substantially above its long-run equilibrium and at an historically high level. This suggests the likelihood of substantial balance sheet adjustment over the coming few years. Of course, it is possible that our estimates of equilibrium gearing overstate the amount of adjustment which needs to take place. They reflect only the tax benefits of gearing and assume that the risks of financial distress are constant over time. It may be the case that the greater macroeconomic stability of recent years has raised the equilibrium level of gearing by reducing the probability of firms suffering financial distress. Against this, there is some evidence that adjustment is already under way in the recent weakness of company dividend payments and the robust move of private non-financial companies into financial surplus (see Chart 7).





To the extent that our estimates of equilibrium gearing are approximately correct, the adjustment process is likely to be protracted in the absence of a substantial stock market recovery. This is borne out by the fact that the move by PNFCs into large financial surplus has been accompanied by only a modest reduction in debt levels. Nevertheless, gearing levels are bound to fall over time if a financial surplus can be sustained. In this sense, it may be that the adjustment that has been made already to expenditure and financing flows is sufficient to have initiated a gradual move of corporate gearing back to equilibrium.

(1) Approximately 40% of quoted PNFCs did not pay a dividend in 2002 which shows that constraints can bind for firms.

Appendix: equation listing

The simulations shown are based on the extension to the Bank's medium-term macroeconometric model (MTMM) described in Benito, Whitley and Young (2001). This appendix documents the changes to the model used from that reported in Benito, Whitley and Young (2001), particularly with respect to the incorporation of a balance sheet adjustment mechanism.

The simulations with balance sheet adjustment use all of the equations listed below. The simulations which do not allow adjustment to take place through investment use the main MTMM investment equation (as reported in Bank of England (2000)) in place of equation (9). The simulations with no balance sheet adjustment use re-estimates of the dividends and net equity finance equations (equations (5) and (8) respectively) without the balance sheet disequilibrium variable (CGEAREX), and the MTMM business investment equation in place of equation (9).

Tax gains to gearing (GAINL)

$$GAINL_t = GAINL_{t-1}$$
(1)

Desired PNFC capital gearing at market value (DSCGEAR)

$$\ln(DSCGEAR_t) = 2.63 + 26.51GAINL_t$$
(2)

where GAINL (equation (1)) is the tax gains to gearing.

Excess PNFC capital gearing at market value (CGEAREX)

$$CGEAREX_t = CGEAR_t - DSCGEAR_t$$
(3)

where *CGEAR* is actual PNFC capital gearing at market value and *DSCGEAR* is desired PNFC capital gearing at market value.

Liquid asset holdings of PNFCs (SLIQ)

$$SLIQ_t = SLIQ_{t-1} + 3819.1 + 0.533 \Delta YPNFCO_t$$
 (4)

where YPNFCO is gross disposable income of PNFCs.

Dividends paid by PNFCs (DIVPNFCO)

$$\ln(DIVPNFCO_t) = -4.008 + 0.292\ln(DIVPNFCO_{t-1}) + 0.894\ln(SLIQ_{t-1}) - 0.219DTAX_t$$

$$- 0.618DTAX2_{t+1} + 1.412DTAX2_t - 0.774DTAX2_{t-1} - 0.028CGEAREX_{t-1}$$
(5)

where *SLIQ* is liquid assets held by PNFCs (equation (4)), *DTAX* is a dummy variable that takes the value of one from 1997 Q3 onwards, *DTAX*2 is a dummy variable that takes the value of one from 1999 Q2 onwards, and *CGEAREX* is excess PNFC capital gearing at market value (equation (3)).

(6)

Net distributions of PNFCs other than dividends (ODIS)

 $ODIS_t = -0.09(GOSPNFCO_t - INTPNFCO_t)$

where GOSPNFCO is gross operating surplus of PNFCs, INTPNFCO is net interest payments of PNFCs.

(7)

Net distributions of PNFCs (DISPNFCO)

$$DISPNFCO_t = DIVPNFCO_t + ODIS_t$$

where *DIVPNFCO* is dividends paid by PNFCs (equation (5)), and *ODIS* is net distributions of PNFCs other than dividends (equation (6)).

Net equity finance of PNFCs (NEF)

 $NEF_{t} = MV_{t}^{*}(0.016 + 0.212(NEF_{t-1}/MV_{t-1}) - 0.0009GOSPNFCY_{t-1} + 0.018\Delta \ln(EQP_{t-1}) + 0.0004CGEAREX_{t-1})$ (8)

where *MV* is the market value of the PNFC sector, *GOSPNFCY* is gross operating surplus as percentage of GDP, *EQP* is equity prices and *CGEAREX* is excess PNFC capital gearing at market value (equation (3)).

Business investment (IBUS)

 $\begin{aligned} \ln(IBUS_{t}) &= \ln(IBUS_{t-1}) - 0.002 + 0.193 \Delta \ln(IBUS_{t-3}) + 0.269 \Delta \ln(IBUS_{t-4}) + 1.523 \Delta \ln(GDP_{t-1}) \\ &- 0.094 [\ln(IBUS_{t-1}) - \ln(KNH_{t-2}) - \Delta \ln(GDP_{t-1}) + 5.263 - 7.796 (\ln(BETA_{t-1}) - \Delta \ln(GDP_{t-1})) \\ &+ 0.580 (\ln(KNH_{t-2}) - \ln(GDP_{t-2}) + \ln(WACC_{t-1}))] - 0.0008 CGEAREX_{t-2} \end{aligned}$ (9)

where *GDP* is GDP, *KNH* is the non-residential capital stock, *BETA* is one minus the business sector depreciation rate, *WACC* is the weighted average cost of debt and equity, and *CGEAREX* is excess PNFC capital gearing at market value (equation (3)).

Definition of the tax gains from gearing (GAINL)

Tax gains from gearing are defined as:

$$GAINL_{t} = \sum_{m} w_{mt} \left(\frac{(1 - \tau_{t}^{m})}{(1 - g_{t}^{m})} r_{t} - (1 - \tau_{t}) r_{t} - \frac{g_{t}^{m}}{(1 - g_{t}^{m})} \pi_{t}^{*} d_{t} \right)$$

where *m* denotes individuals or pension funds, *r* is the interest rate, w_m is the weight of investor *m*, τ^m is the income tax rate paid by *m*, g^m is the capital gains rate paid by *m*, τ is the corporate tax rate, π^* is expected inflation and *d* takes the value of one when the capital gains system is indexed and is zero otherwise.

Macro variables used in calculating the tax gains from gearing

Variable	Data source
One-period nominal interest rate (r)	0.0025*(ONS code AMIH)
Price index (P)	After 1987: ONS code CHMK Before 1987: ONS codes <u>(ABJQ + HAYE)</u> (ABJR + HAYO)
	Series spliced using ratio between the two in 1987 Q1

Expected one-period inflation rate (π^*)

Equity held by *m* as a proportion of total holdings of individuals and pension funds (w_m)

 $\pi_{t}^{*} = (P_{t+1}/P_{t}) - 1$

Calculated using data from ONS Share Ownership reports and from Young (1992)
Tax rates used in calculating tax gains from gearing

Variable	Group	Data source
Corporation tax rate (τ)	-	Main rate of corporation tax
Personal income tax rate (τ^m)	Individuals	Basic rate of income tax
Personal income tax rate (τ^m)	Pension funds	Zero
Personal capital gains tax rate (g ^m)	Individuals	Capital gains tax rate
Personal capital gains tax rate (g ^m)	Pension funds	Zero
Indexation of capital gains tax dummy (d)	-	Is 1 from 1982 Q2 onwards

Definitions of other non-MTMM variables used

Variable

PNFC capital gearing at market value (CGEAR)

Excess PNFC capital gearing at market value (CGEAREX) Net distributions of PNFCs (DISPNFCO) Dividends paid by PNFCs (DIVPNFCO) Desired PNFC capital gearing at market value (DSCGEAR) Gross operating surplus of PNFCs (GOSPNFCO) Gross operating surplus of PNFCs as a percentage of GDP (GOSPNFCY) Net interest payments of PNFCs (INTPOUT) Market value of PNFCs (MV) Net equity finance of PNFCs (NEF) Net distributions of PNFCs other than dividends (ODIS)

Liquid asset holdings of PNFCs (SLIQ) Gross disposable income of PNFCs (YPNFCO) Data source

From 1990 Q1 ONS codes: <u>NLBE + NLBI + NKZA - NKJZ</u> <u>- NYOT</u> Spliced at 1990 Q1 with data from Young (1993) Defined by equation (3) Defined by equation (7) ONS code: RVFT Defined by equation (2) ONS code: CAER ONS codes: 100*(CAER/CGCB)

ONS code: ROCG – ROAY ONS code: – NYOT ONS codes: NEVL – NESH ONS codes: CAER – RPBO – ROCG + ROAY – RVFT ONS code: NKJZ ONS code: RPKZ

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Implicit interest rates and corporate balance sheets: an analysis using aggregate and disaggregated UK data

Working Paper no. 193

Andrew Benito and John Whitley

This paper examines evidence for effects on the cost of corporate debt finance from net worth. The central issue we address, confronted with data at both the aggregate and individual company levels, is whether implicit corporate interest rates reflect the strength of corporate balance sheets. In particular, such an effect is emphasised by the credit channel of the financial accelerator literature.

The analysis begins by exploring measures of implicit interest rates, deriving aggregate data from national accounts. Using a simple conceptual framework the paper estimates single time series models that relate implicit interest rates to risk-free rates and measures of corporate indebtedness. It finds evidence for a non-linear role for capital gearing, where gearing only changes the implicit interest rate when it is at relatively high levels. This is consistent with the prediction from the financial accelerator literature that balance sheet weakness should give rise to an increase in the external finance premium, although that does not depend on non-linearity.

The paper also uses company-level data to relate implicit rates to balance sheet measures of gearing and liquidity. Although non-linear effects are not found, the results confirm a significant positive relationship between implicit interest rates and balance sheet conditions.

Finally, the possible quantitative role that the finance premium may play in the propagation of shocks is considered. Simulations are presented using the time series equation in an aggregate macro model. The results show that implications for corporate liquidations can be quite sensitive to the presence of the non-linearity, although the sensitivity depends on the source of the shock.

A Merton-model approach to assessing the default risk of UK public companies

Working Paper no. 194

Merxe Tudela and Garry Young

The quantitative modelling of credit risk shows how the probability of company default can be inferred from the market valuation of companies under specific assumptions on how assets and liabilities evolve. This paper employs a Merton-style approach to estimate default risk for public non-financial UK companies and assesses the reliability of these estimates using a range of different techniques.

The original Merton model is based on some simplifying assumptions about the structure of the typical firm's finances. The event of default is determined by the market value of the firm's assets in conjunction with the liability structure of the firm. When the value of the assets falls below a certain threshold (the default point), the firm is considered to be in default.

To draw conclusions on financial stability and implement the right policy measures, the estimated probabilities of failure need to be both reliable and efficient. This paper assesses the reliability of the estimates by examining their success in predicting the failure or survival of both failed companies and survivors. The efficiency of the estimates is assessed by testing the extent to which the predictive power of the estimates could be improved by incorporating other information publicly available in company accounts. Models that combine a Merton approach with additional financial information are referred to in the literature as 'hybrid models'.

The probability of default derived from our Merton-model implementation provides a strong signal of failure one year in advance of its occurrence. For example, the mean value of the estimated one-year probabilities of default for our entire sample is 47.3% for those companies that went bankrupt, and 5.4% for those that did not.

Calculation of Type I and II errors (Type I errors are defined as the percentage of actual failures classified as non-failures, Type II errors are the percentage of non-failures classified as failures) suggests that the estimated probabilities of default are successful in discriminating between failing and non-failing firms. Classifying defaults as those firms with an estimated probability of default greater than or equal to 10%, the Type I error is relatively modest at 9.2% (with a Type II error of 15.0%).

Our implementation of the Merton approach clearly outperforms a reduced-form model based solely on company account data. But our analysis also shows that the type of hybrid models implemented here, ie those combining company account information and the Merton approach, outperform our implementation of the Merton approach, if only marginally.

Forecasting inflation using labour market indicators

Working Paper no. 195

Vincenzo Cassino and Michael Joyce

There are a large number of labour market indicators that could be used by monetary policy makers to assess the state of the labour market and the associated implications for inflationary pressure. A non-exhaustive list, taken from recent Bank of England *Inflation Reports*, would include the unemployment rate (measured from both claimant count and the Labour Force Survey), the employment rate, the non-employment rate, measures of skill shortages, and the ratio of vacancies to unemployment. This paper attempts to shed some light on how much weight should be attached to these and other labour market indicators by evaluating them against a simple criterion: their past performance in predicting price and wage inflation.

We compare the performance of 30 labour market indicators (derived from 16 underlying labour market variables) in forecasting three different price and wage inflation measures-based on the RPIX, the DGI-RPIX and the AEIover various sample periods from the mid-1970s to 2000. To model the relationship between inflation and each labour market indicator, we estimate a reduced-form inflation equation ('a backward-looking Phillips curve'), in which the change in inflation is specified as a data-determined function of past inflation, the labour market indicator itself and (in the case of RPIX and nominal earnings growth) real import price inflation. Where appropriate, we derive our indicator measures by first detrending the underlying labour market variable using a Hodrick-Prescott filter to form a 'gap' measure (ie an estimate of how far the variable is away from its trend) but, as a cross-check, we also separately examine the effect of using the first difference of the variable.

Two basic approaches are used to assess the

inflation-forecasting properties of each labour market indicator. We examine their *ex-post* forecast performance, by carrying out Granger causality tests based on data from the mid-1970s onwards, to see whether the indicators provide any information about movements in inflation not captured by the past history of inflation itself and (where appropriate) real import price inflation. Since they are backward looking, however, these tests do not tell us how useful particular labour market indicators would have been in genuine forecast situations. We therefore also consider the *ex-ante* forecast performance of the indicators, using simulated out-of-sample forecasting tests for the period 1985–2000. This procedure involves adding each of our selected labour market indicators to an inflation-forecasting equation that is estimated, either recursively or over a rolling sample, moving forward the end of the sample period one quarter at a time. The lag lengths of the variables in the equation are re-optimised over each period and the equation is used to forecast out of sample. By limiting our information set to data only available at the time of the forecast, this method should provide a better approximation to how the models would have predicted inflation in 'real time'. We then compare the out-of-sample forecasts of these indicator models with predictions from an autoregressive model of inflation and with other simple benchmark models.

The in-sample and out-of-sample criteria lead to rather different conclusions about the forecasting performance of the different indicators. According to the in-sample Granger causality analysis, most labour market indicators appear to be statistically significant in an inflation-forecasting equation. However, the out-of-sample forecasting analysis suggests that a much smaller number of labour market indicator models are better at forecasting changes in inflation than an autoregressive model, and that virtually none outperform this benchmark over the period since 1995. Moreover, the individual labour market indicator models that perform relatively well out of sample tend to be sensitive to the precise choice of inflation measure, sample period and estimation method. Interestingly, one seemingly robust result is that the unemployment rate gap, the most commonly used measure of labour market tightness, performs poorly across a range of specifications.

There are a number of possible reasons for the poor out-of-sample performance of most of the labour market indicator models examined. One contributory factor is that neither the Hodrick-Prescott or difference filters are likely to do a good job in capturing the time-varying trend of the underlying labour market variable. However, general model instability and overfitting in the estimation also contribute, probably reflecting the reduced-form nature of the analysis, which makes it vulnerable to structural and policy changes, as well as to changes in the pattern of shocks hitting the economy. Since no specific indicators are superior in all circumstances, we suggest that the best approach is to take into account a wide variety of information in forming an assessment of the labour market, in line with current practice. This conclusion is reinforced by the fact that simple combination forecasts, based on taking the median or trimmed mean of forecasts based on the individual indicator models, generally produce more reliable results.

UK business investment: long-run elasticities and short-run dynamics

Working Paper no. 196

Colin Ellis and Simon Price

Neoclassical theory tells us that a profit-maximising firm's desired capital/output ratio depends on the real user cost of capital: this is the long-run equilibrium relationship. On the steady-state growth path, firms remain at the optimal capital/output ratio by re-investing to offset depreciation and steady-state growth in the capital stock. With a stationary depreciation rate, this implies that in long-run equilibrium the investment/capital ratio is fixed. This is a second long-run equilibrium relationship.

In this paper we exploit a measure of the capital stock constructed at the Bank, and a real user cost of capital measure that explicitly incorporates relative prices. We relax the standard assumption of Cobb-Douglas technology that restricts the elasticity of substitution to unity, and instead use a constant elasticity of substitution (CES) production function that nests Cobb-Douglas as a special case. As described above, our theoretical framework implies two long-run equilibrium relationships: one between capital, output, and the real user cost; and the other between investment and capital. These theoretical long-run relationships imply restrictions on the model. They also imply a single reduced-form long-run relationship between investment, output and the real user cost.

We estimate this system as a vector error-correction mechanism (VECM) using the Johansen method. Our two long-run relationships form the basis for the two cointegrating vectors in the model. The model is statistically well specified and the overidentifying theoretical restrictions on the model are accepted. A key result is that the elasticity of substitution between labour and capital in production is significantly lower than unity at a little under 0.45. This estimate is obtained by a variety of measures and estimation techniques, and, as judged by external estimates, is plausible. This is a remarkable result, because most studies of aggregate investment have found it hard to find a significant relationship of the correct sign between investment and the user cost.

The model also tells us how investment and capital respond when the system is not in long-run equilibrium. Investment responds when the capital/output ratio is away from equilibrium, while capital responds when the investment/capital ratio is away from equilibrium. This last result is consistent with a log-linearisation of the capital accumulation identity. As with other aggregate investment models, the model takes a long time to reach the long-run equilibrium.

Despite the robust nature of our elasticity of substitution estimate, different estimation methods yield different results for the dynamics of investment. In particular, single-equation estimation results suggest that investment responds to disequilibrium in the investment/capital ratio, while our system estimation results suggest it does not respond to the investment/capital ratio.

We investigate this puzzle using simulations. We specify a model assuming the VECM results are correct, and use it to generate artificial data series for the four variables. Investment models are estimated on the artificial data using the single-equation and system techniques, and tested to see which technique correctly estimates the 'true' model. The system estimation is better at correctly estimating the dynamics than single-equation estimation, but rejects the restrictions from the theoretical long-run relationships too often. The single-equation results find the investment/capital ratio to be significant because they implicitly estimate the reduced-form long-run relationship, rather than the two separate long-run relationships.

E-barter versus fiat money: will central banks survive?

Working Paper no. 197

F H Capie, Dimitrios P Tsomocos and Geoffrey E Wood

Recent and extremely rapid development in computer technology has led to the emergence of what is called 'e-money'. This refers to technological developments which in effect give people much easier access to their bank accounts, and make the carrying of notes and coin unnecessary. Rather people carry 'electronic purses', cards which are loaded with monetary units in electronic form, and from which funds can be transferred directly, not intermediated through the banking system, onto another person's card or into a shop keeper's till. Those developments have been used so far on a geographically limited and essentially experimental basis, but this has not prevented conjecture that the development may go further.

This further stage is one where computer technology will replace money altogether. Goods will exchange directly for goods, and we shall return to barter, in electronic form, with computer technology lowering the costs of information storage and transmissions such that barter is a cheaper form of exchange than exchange using fiat money. In this paper the conditions under which the replacement could occur are analysed formally.

Key to our discussion is the medium of exchange function of money. We argue first that money evolved as a way of reducing the costs of transacting. It economises on information, by making all information about the buyer in a particular transaction irrelevant, and concentrating attention on what is being offered. As society evolves towards the use of a single money, so it evolves to a situation where the same information is needed for every transaction. One good will emerge as the money of a society, provided two conditions are satisfied. These are that not all goods are equally suitable as a medium of exchange and that the marginal costs of acquiring information about one good fall the more that good is used.

Having argued informally that the information-economising property of money is key to its evolution, a model of exchange based on that property is developed, and the cost of transacting in that system is compared with the cost of barter. The model is of a strategic market game, in which the stipulated means of exchange is fiat money and all transactions need cash in advance. (Note that constraint is not imposed arbitrarily, but emerges as a natural consequence of our prior argument that money exchange requires less information than does barter exchange.)

The model is then contrasted with one of 'electronic barter'. The costs of one method are compared with those of the other, and it is shown that unless inflation drives up the nominal interest rate substantially, fiat money exchange will continue to dominate electronic barter.

Further, it is shown that, if the government and the monetary authorities desire to do so, they can drive the costs of fiat money exchange towards zero. Accordingly, the paper concludes that in this model of an exchange economy fiat money will survive, and with it a meaningful and controllable price level. The paper also conjectures that these results would hold *a fortiori* in a model with production as well as exchange.

Non-interest income and total income stability

Working Paper no. 198

Rosie Smith, Christos Staikouras and Geoffrey Wood

It is generally believed that diversification by a firm reduces risk, just as diversification of investments by an individual does. In both cases, however, whether the desired risk reduction effect is achieved does of course depend on the correlation between the different activities or lines of business (in the case of the firms), and on the correlation between the prices of the different investments (in the case of the investing individual). Banks, like other firms, generally seek to reduce their risks by diversifying across various lines of business, although there is usually some degree of specialisation. In recent years, banks have started to move increasingly into areas that yield non-interest income-into activities that earn fees rather than interest. Some banks (traditionally, for example, the United Kingdom's merchant banks), have always concentrated on fee-earning activities, such as advising on how to raise capital. All banks have traditionally earned some fee income—the trustee business is a good example. The traditional fee-earning business was both a small part of most banks' earnings and indubitably little affected by such factors as fluctuations in the economy. But as the profitability of traditional banking activities has, for a wide variety of reasons, come under pressure in recent years, fee-earning activities have greatly increased their contribution to bank profits. It is therefore important to see whether these new activities offset fluctuations in other sources of earnings as successfully as did traditional fee-earning work. Addressing that question is the aim of this paper.

Having summarised the results of various earlier studies in the opening of the paper, the behaviour of interest and non-interest income is then discussed, first in broad outline for all EU banking systems, and then in some detail for the systems of Germany and the United Kingdom. The paper examines the variability of each source of income, as well as the correlation between these different sources. Where possible, the results are reported not just for the banking systems as a whole, in the countries of the EU but also by size and type of financial institution. By comparing the behaviour of fee and non-fee income the paper examines how the move into fee-earning activities changes the range of risk and return possibilities for banks. Other studies have considered whether increased fee income reduces or increases the riskiness of banks. But whether the change in risk is a result of banks' behaviour or of the nature of the two income streams is inevitably left obscure. This paper looks at the nature of non-interest income, concentrating in particular on the extent to which it represents not earnings from new activities, but earnings from performing the same business in a new way—for example earning a fee by arranging a loan for a customer rather than earning an interest spread by lending to the customer. Sources of non-interest income for depository institutions include securitisation and other major off balance sheet activities. Some of the different results obtained in this paper may be a product of the heterogeneity of fee-earning activity. The paper also considers why the changes have taken place; this may have implications both for the durability of the changes (were they the result of a passing fashion, or of some more durable change in conditions) and for future regulation or supervisory policy.

In broad outline, the paper finds that fee-earning income is less stabilising than seems generally believed; indeed, fee-earning income is actually more variable for most categories of banks than traditional interest income. It does, however, help in most cases to stabilise profit streams.

Credit risk diversification: evidence from the eurobond market

Working Paper no. 199

Simone Varotto

It is well known that portfolio risk can be reduced through diversification. Spreading portfolio holdings across countries and industrial sectors, for example, may help reduce portfolio volatility. It is less clear, however, whether these asset allocation strategies are effective in reducing return volatility from changes in credit spreads in a bond portfolio. While equity portfolio diversification has been widely investigated, diversification in portfolios of corporate bonds has only been analysed partially and sporadically.

This study looks at the effects of cross-country and industry diversification on credit risk. It also analyses other dimensions, namely maturity, seniority and credit rating diversification, because return uncertainty in bonds with different maturity, seniority and rating might be explained by different risk factors which are not perfectly correlated. For example, a firm's credit rating may determine the ease with which the firm can access financial markets for funding or decide the balance of power with customers and suppliers, when setting contractual obligations, such as terms of payments or speed of delivery. It follows that differences in credit standing may affect the firm's economic environment and the risk factors that influence the firm's profitability. This, in turn, allows the portfolio manager who invests in companies with varying credit quality to achieve diversification benefits.

The paper's analysis departs from the existing literature by introducing 'locally systematic' risk factors whose nature is systematic and idiosyncratic at the same time. Usually, diversification is defined as the reduction of idiosyncratic risk in the portfolio. The paper maintains the assumption that portfolio volatility is reduced through diversification of idiosyncratic risk as well as locally systematic risk. The latter is represented by country, industry, maturity, seniority and rating factors, estimated as deviations from the average market return. The average market return is truly systematic because it cannot be diversified away. Locally systematic risks, on the other hand, can be diversified away only if the portfolio is distributed across assets that are subject to different local factors. For example, to diversify the (locally systematic) German country effect in a portfolio of German bonds one needs to invest in other countries. Increasing the number of German securities would only reduce the idiosyncratic risk of the portfolio, narrowly defined as residual or unexplained bond volatility. Therefore, locally systematic risks are more persistent than idiosyncratic risk in that only a specific portfolio allocation strategy would cause their diversification. At the same time, they are not as persistent as the average market return since they too can be diversified away. This approach gives more structure to what was previously indistinctly described as idiosyncratic risk. It also provides a formal framework to describe phenomena that are already known and widely applied by portfolio managers.

The findings in the paper suggest that international diversification is most effective in reducing portfolio credit risk. Previous studies have shown that a similar conclusion also applies to equity risk. Surprisingly, diversification across maturity bands is found to be the second best strategy, superior to industry diversification.

Finally, the results may have a bearing on the ongoing debate on how to reform the current framework for setting banks' credit risk capital requirements. The capital adequacy rules in Pillar 1 of the New Basel Accord, as in the current Accord, do not take into account diversification effects on portfolio risk. Therefore, the results emphasise the potential importance of Pillar 2 of the new Accord within which supervisors are encouraged to take into account the extent of sectoral and geographical portfolio concentration when assessing the riskiness of banks relative to the capital they hold.

Inflation targeting and the fiscal policy regime: the experience in Brazil⁽¹⁾

By Francesco Giavazzi, Houblon-Norman Fellow,⁽²⁾ Professor of Economics at Bocconi University, Milan and Visiting Professor of Economics at the Massachusetts Institute of Technology. The views expressed in this article are the author's and do not necessarily reflect those of the Bank of England or the Monetary Policy Committee.

This article reviews the recent experience of Brazil showing that credit risk is at the centre of the mechanism through which a central bank might lose control of inflation. Brazil during 2002 came close to a situation where fiscal policy hindered the effectiveness of monetary policy. But in early 2003 a change in investors' perception of the long-run fiscal stance brought the economy back to normal conditions, reducing credit risk, stabilising the exchange rate and, through these two variables, inflation expectations, inflation and the dynamics of the public debt. Brazil's experience could thus offer useful lessons for other emerging market economies, which consider adopting inflation targeting as their monetary policy rule.

Introduction

After the transition to a floating exchange rate, in January 1999, Brazil adopted an inflation-targeting regime. Analysis of monetary policy decisions since the floating of the currency shows that the central bank, the Banco Central do Brasil, has adjusted the short-term interest rate, the Selic, based on expected developments in consumer price inflation. This regime was initially a success. After a 60% devaluation in January 1999, consumer price inflation remained essentially stable: the yearly rate of increase of consumer prices, measured by the IPCA index, was 8.9% in 1999 and 6% in 2000. In 2001 the exchange rate fell again, by 25%, but inflation remained below 8%.

The honeymoon ended in early 2002. During that year the exchange rate depreciated by 38% and consumer price inflation jumped to 12.5%. This was not the result of a shift in monetary policy: interest rate decisions continued to be based on developments in inflation expectations, and the Selic rate rose to 26.5%. Since early 2003, inflation expectations and actual inflation have declined, while the exchange rate has recovered significantly.

The Brazilian case is interesting. Brazil's public debt is about 60% of GDP, a relatively high ratio for an emerging market, and total tax revenues are 30% of GDP. Brazil's debt level is consequently more comparable with that of a European country where debt is around 100% of GDP, and taxes are close to 50% of GDP. Brazil's public debt, moreover, is either of very short duration, or indexed to the dollar. In such an environment, an increase in interest rates could lead to higher debt, higher credit risk, an exchange rate depreciation and, so, to higher rather than lower inflation. This effect could dominate more traditional channels. In such an environment, fiscal policy and perceptions of it have a prominent role to play in fighting inflation.

(1) This article draws freely from recent research on monetary and fiscal policy in Brazil jointly conducted with Olivier Blanchard, Carlo Favero, Alessandro Missale and Charles Wyplosz (Blanchard (2003), Favero and Giavazzi (2002, 2003), Missale and Giavazzi (2003) and Wyplosz (2003)). I thank them for having allowed me to use here many of the arguments and results presented in those papers.

⁽²⁾ The Houblon-Norman Fund, a registered charity, was created in 1944 in commemoration of the Bank's 250th anniversary. It was named after Sir John Houblon, the first Governor of the Bank and Montagu Norman, the retiring Governor in 1944. Fellowships are awarded 'to promote research into and disseminate knowledge and understanding of the working, interaction and function of financial business institutions in Great Britain and elsewhere and the economic conditions affecting them.' George Fellowships were established within the Fund in June 2003, in recognition of the life-long achievements and service to the Bank of Sir Edward George and in particular his role as the first chair of the Monetary Policy Committee. The Houblon-Norman/George Fund is administered by Trustees, on the advice of an expert Committee. Senior Fellowships are awarded to distinguished researchers who have established a reputation in their field. Fellowships are also available for younger post-doctoral or equivalent applicants.

Fiscal dominance: theory and lessons from Brazil

The difficulties of running monetary policy in an environment where financial markets think that fiscal policy is unsustainable—in the sense that the expected sequence of future primary surpluses is considered, by investors, not to be large enough given the level of the public debt and the cost of debt service—are well known. Sargent and Wallace (1981) were among the first to point out that a reduction in the growth rate of money can result in higher, rather than lower, inflation if the government relies on seigniorage as a source of revenue, and the budget surplus is not adjusted after the fall in seigniorage revenue.⁽¹⁾

Sometimes, and often with specific reference to Latin America, this situation is referred to as a 'regime of fiscal dominance'.⁽²⁾ More recently, the inability to control inflation if fiscal policy is believed to be unsustainable has been mentioned as an example of the 'fiscal theory of the price level', a view according to which fiscal, rather than monetary, policy is the main determinant of inflation.⁽³⁾

In the model analysed by Sargent and Wallace (1981), the mechanism through which the central bank loses control of inflation is the expectation that it will eventually have to give in and finance the government budget through money creation. In models of the fiscal theory of the price level, the mechanism is different but the final outcome is similar. In these models the price level is the only variable that can balance the government's intertemporal budget constraint. Assuming that the sequence of future budget surpluses is given, there is only one price level that makes the stock of nominal bonds inherited from the past consistent with the present value of those primary surpluses. Consequently, it is the government's intertemporal budget constraint that determines the price level.

While analytically elegant, these models are too simple to describe financial markets in emerging market economies. That is because they typically overlook credit risk, a variable that is at the centre of macroeconomic developments in these countries. The experience of Brazil shows, in particular, that credit risk is the channel through which international financial shocks can push an emerging market economy into a regime of fiscal dominance.

Our illustration of how an inflation-targeting central bank might lose control of inflation will thus start from an analysis of the determinants of credit risk, and then move on to study how this interacts with the exchange rate, inflation, domestic monetary policy and the dynamics of public debt.

Credit risk, the exchange rate, monetary policy and the debt

The Brazilian economy has been heavily influenced by the fluctuations in the emerging markets bond index (EMBI) spread. This spread, which measures the difference between the yield on a dollar-denominated bond issued by the Brazilian government and a corresponding one issued by the US Treasury, indicates the market assessment of the probability that Brazil might default on its debt obligations.⁽⁴⁾ The Brazilian EMBI spread was 700 basis points in February 2002 and reached a peak of 2,400 basis points in September; after the October election the spread has gradually fallen, returning to around 670 basis points in September 2003 (for reference, throughout this period the Mexican spread has fluctuated between 200 and 400 basis points).

Fluctuations in the EMBI spread have been accompanied by similar fluctuations in the exchange rate (see Chart 1). Capital flows are part of the reason for this close correlation. An increase in the risk premium leads to a sudden halt to capital flows and thus to a (real) depreciation, which is needed to generate the trade surplus required to offset the decline in capital inflows. Since half the Brazilian public debt is denominated in dollars, fluctuations in the exchange rate thus produce corresponding fluctuations in the ratio of debt to GDP (see Chart 2 and Table A).

Domestic interest rates at all maturities are also indirectly affected by fluctuations in the EMBI spread. The policy rate, the Selic rate, is affected because

⁽¹⁾ See also Drazen and Helpman (1987) for an example where the fall in money creation results from the decision to peg

the exchange rate. Sims (2003) discusses the limits of inflation targeting also in relation to fiscal dominance.

⁽²⁾ See for instance Tanner and Ramos (2002) for a discussion of fiscal dominance in the Brazilian context in an earlier period. The difficulties of targeting inflation in the presence of fiscal dominance are also discussed in Fraga, Goldfajn and Minella (2003).

⁽³⁾ See Woodford (2001) and Loyo (1999) for a specific application to Brazil.

⁽⁴⁾ The EMBI is computed by JP Morgan.

Chart 1 Brazil, the EMBI spread and the exchange rate



Chart 2 Brazil, the exchange rate and the net public debt



Table A

Composition of the Brazilian public debt, December 2002

Per cent

Dollar-denominated bonds issued abroad Fixed-rate bonds	
Inflation-indexed bonds	
Domestic bills indexed to the dollar Domestic floaters linked to the Selic rate	
Other	

exchange rate fluctuations affect inflation expectations, and the central bank looks at inflation expectations when deciding on the level of the Selic rate. Moreover, an increase in the EMBI spread can affect inflation expectations directly if it is accompanied by concerns about the possibility of future monetisation of part of the public debt.

Domestic interest rates at longer maturities (where 'longer' means one to six months) are affected by the

EMBI spread via two channels: indirectly, because fluctuations in the Selic rate move the term structure, and directly because domestic financial instruments of longer maturities are not immune from credit risk.

The bottom line is that the cost of servicing the public debt, and the debt level itself, fluctuate very closely with the EMBI spread. Understanding what determines the EMBI spread is thus central to any discussion of macroeconomic policy in Brazil.

What determines the Brazilian EMBI spread?

The empirical evidence documents a high correlation between emerging market spreads and common international factors.⁽¹⁾ Calvo (2003), for instance, has observed that changes in such spreads are correlated with worldwide measures of investors' appetite for risk, such as the spread between US corporate bonds and US Treasuries. In fact, Calvo goes as far as suggesting that once one accounts for the US corporate spread, domestic factors in emerging markets appear to be irrelevant in explaining the spread.⁽²⁾

In the case of Brazil one also finds a positive correlation between its EMBI spread and the US corporate spread. This correlation, however, is not constant over time (see Chart 3): it appears to depend on the state of domestic macroeconomic fundamentals, and fiscal fundamentals in particular. When these are sound, the response of the EMBI spread to the US corporate spread is muted compared with periods when the fiscal fundamentals are relatively weak. Favero and Giavazzi (2003) find that the elasticity of the EMBI spread with respect to the US corporate spread is about 0.4 for a ratio of debt to GDP below 0.55, which increases asymptotically to 0.8 as the debt ratio rises.⁽³⁾

This finding has important implications for Brazil. It suggests that the ability of the economy to withstand international financial shocks critically depends on investors' perception of the country's future fiscal stance. Our estimated threshold—a debt-to-GDP ratio of 0.55—might capture the moment where investors' perceptions shift. The reason for such a shift could be the perception that beyond a given debt-to-GDP ratio, fiscal policy is not flexible enough to respond to

(1) Dungey et al (2000), for instance, find that most of the variability of world spreads is explained by a common international factor. There are, however, different views as to what such a factor might be. Arora and Cerisola (2001) find that the stance and predictability of US monetary policy are significant in determining capital market conditions in emerging markets. Kamin and von Kleist (1999) and Eichengreen and Mody (2000) report a negative relationship between the level of long-term US interest rates and emerging market spreads.

25.8 3.0 8.5 23.9 31.1

⁽²⁾ Calvo's finding is confirmed in Herrera and Perry (2002).

⁽³⁾ See Blanchard (2003) for empirical results along the same lines.

Chart 3 Brazil, the EMBI spread and the US corporate bond spread



fluctuations in the debt. Consider, for example, the effects of an international shock that raises the risk premium and thus the cost of debt service—the more so, the higher the debt ratio. The increase in the primary surplus required to keep the debt sustainable is larger, the higher is the initial debt ratio. If fiscal policy is not flexible enough, the initial increase in the risk premium is amplified, further widening the gap between the country's primary surplus and the level that would be necessary to stabilise the debt.

There might thus be two very different monetary policy regimes, depending on the interaction between international factors (investors' appetite for risk) and domestic fiscal policy. In the 'good' regime, the country is resilient enough to withstand international financial shocks, credit risk is low and monetary policy works in the usual way. Instead, when fiscal fundamentals are weak—because the debt is high and/or fiscal policy is unsustainable—credit risk and the economy may shift to a 'bad' equilibrium, where monetary policy can have perverse effects.

The dynamic effects of monetary policy in the bad equilibrium (the one characterised by fiscal dominance) can be described as follows. With a short duration of the public debt, an increase in the Selic rate raises the cost of debt service: if the primary budget surplus remains unchanged, the debt level rises, and so does the EMBI spread. The increase in the spread adds to the initial increase in debt, because it is accompanied by a depreciation of the exchange rate, which raises the value of dollar-denominated bonds in terms of domestic GDP. The exchange rate depreciation also affects inflation expectations and, eventually, actual inflation. This induces the central bank to increase the Selic rate further, which again raises the cost of debt service, and so on.

There is one caveat in this description. An increase in the Selic rate has two effects on the exchange rate. The direct impact, related to interest rate arbitrage, is positive: an increase in the Selic rate appreciates the exchange rate. But there is also a second effect: if an increase in the Selic rate raises the debt level and credit risk, the EMBI spread will rise and the exchange rate will depreciate. The second channel explains why monetary policy may have perverse effects.

Inflation targeting in Brazil

The best way to describe Brazilian monetary policy since the adoption of a floating exchange rate regime is through a simple monetary policy rule where the Selic rate responds to one year ahead inflation expectations. A measure of inflation expectations is available, in Brazil, from the daily survey conducted by the central bank.

Estimation of such a rule, over a sample period starting with the adoption of inflation targeting in early 1999, finds that the response of the Selic rate to an increase in one year ahead (survey-based) inflation expectations is greater than unity, a finding that suggests that monetary policy does not accommodate inflation and that real interest rates are raised when inflation expectations increase. The Selic rate also appears to be rather persistent, with an autocorrelation coeffcient of 0.84. Chart 4 shows the path of actual Selic rates since January 2000, and the Selic rate obtained through the (dynamic) simulation of the estimated policy rule (see Favero and Giavazzi (2002) for a description). The chart shows that the estimated rule performs rather well. It is

Chart 4 Brazil, actual path of the Selic rate and path simulated using estimates from a policy rule



interesting to note that if one augments this simple monetary policy rule by adding more explanatory variables, such as, for instance, the exchange rate or a measure of the output gap, none of them appears to be significant, suggesting that the Banco Central do Brasil applies a rather 'clean' version of inflation-forecast targeting.

Inflation targeting under different fiscal policy rules

In this section, using a simple macroeconomic model of Brazil, we illustrate how the economy might end up in a regime where inflation targeting has perverse effects, and what would be needed to return it to a normal situation. The model is estimated in Favero and Giavazzi (2003) and consists of two main equations: one for the determinants of the EMBI spread, which we discussed above, and another that specifies a fiscal rule. These are complemented by three more equations, for the exchange rate, for inflation, and for inflation expectations.

A regime of fiscal dominance is one in which the primary budget surplus does not respond, or not enough, to fluctuations in the level of the debt and in the cost of debt service. The estimated fiscal policy reaction function for Brazil over the period January 1999 to January 2003 shows that the primary surplus is rather persistent (despite having increased from around 2% to just above 4% of GDP since 1998) and that neither the response to fluctuations in the debt, nor in the cost of debt service are very significant. In such a situation even small international shocks, such as those that hit Brazil in 2002, might be enough to push the economy into a bad equilibrium.

Charts 5 and 6 help to understand the dynamics of the economy in the bad and the good equilibrium.

Monetary policy with the estimated fiscal rule

We start from the macroeconomic conditions prevailing at the beginning of 2003. At that time, the debt level was 57% of GDP, just above the estimated threshold; the primary surplus was 4% of GDP, inflation was 12%, the central bank inflation target had just been raised to 8.5%, and the Selic rate was 25%. We then simulate the model from July 2003 onwards, using the inflation target path announced by the central bank: 8.5% in 2003 and 5.5% in 2004.

We keep the inflation target constant at 8.5% throughout 2003. In 2004 we then allow the target to fall gradually, reaching 5.5% in December. Moreover, we keep the federal funds rate and ten-year US interest rates fixed at their levels in January 2003 (of 1.25% and 3.36% respectively). The results are shown in Chart 5.

The simple monetary policy rule brings the Selic rate as high as 32%, but the jump in the risk premium prevents monetary policy from stabilising the exchange rate and the debt level rises. Although the debt does not spiral out of control and inflation does not diverge from target, the risk premium effect has important consequences and monetary policy has a perverse effect on the exchange rate. Inflation fluctuates at very high levels, despite the aggressive monetary policy. The increase in the debt ratio induces a tighter fiscal stance, but the increase in the primary surplus from 3.9% to 4.1% of GDP is insufficient to stabilise the economy.⁽¹⁾

Monetary policy with a more aggressive fiscal rule

Next, we ask what change in the fiscal rule would be necessary to make monetary policy effective. We experiment with rather mild modifications in the estimated fiscal rule, which we change in three ways.

- We increase the response of the primary deficit to deviations of the ratio of debt to GDP from 55%.
- We reduce the persistence of the primary deficit.
- We increase the long-run surplus from 4% to 5%.

The results are reported in Chart 6. With the new fiscal rule, a small increase in the Selic rate is enough to appreciate the exchange rate. That is because the effect of the Selic rate now dominates in the exchange rate equation, causing the exchange rate to appreciate. The appreciation lowers the debt ratio immediately, and is accompanied by a fall in the EMBI spread. Inflation also falls.

In this exercise a rather minor change in the fiscal rule is sufficient to eliminate the perverse effect of monetary policy. That is because the Brazilian debt level in early

⁽¹⁾ This exercise does not display the explosive inflation behaviour described in Loyo (1999) and Sims (2003) in the case of a 'non-Ricardian' fiscal regime. That is because the estimated fiscal policy reaction function implies an increase in the primary surplus as the debt ratio rises: it is thus 'Ricardian', though only weakly so. However, the fact that the EMBI spread remains high prevents the monetary authority from bringing inflation back close to the target.

Chart 5 The simulated effects of targeting inflation with a less aggressive fiscal policy rule







Net public debt





Inflation



Inflation expectations





Primary deficit



Chart 6 The simulated effects of targeting inflation with a more aggressive fiscal policy rule







Net public debt





Inflation



Inflation expectations



Output gap Per cent _____ 0.8 - 0.6 _ - 0.4 0.2 _ + 0.0 - 0.2 - 0.4 July 2003 July 05 July 04 Jan. Jan.

Primary deficit



2003 was very close to the point where investors' perceptions of solvency shift, as estimated in Favero and Giavazzi (2003).

As discussed above, what we may be describing are the effects of a shift in investors' perceptions of the future fiscal stance induced by a small change in current fiscal policy.

Fiscal policy under the Lula government

One of the first announcements of Brazil's new President, Ignacio Lula da Silva, was an increase in the target for the primary budget surplus, from 3.75% to 4.25%. The outcome for 2003 might actually be even better, since the increase in inflation has improved the budget: revenues are indexed to GDP, while expenditure is generally fixed in nominal terms. The change in fiscal policy was apparently minor, but may have served to shift the economy to a 'good' equilibrium.

Conclusions

We have reviewed the recent experience of Brazil to show how credit risk can be at the centre of the mechanism through which a central bank that targets inflation might lose control of inflation—in other words, of the mechanism through which the economy might move from a regime of 'monetary dominance' to one of 'fiscal dominance'.

The literature, from Sargent and Wallace (1981) to the modern 'fiscal theory of the price level', has discussed how an unsustainable fiscal policy may hinder the effectiveness of monetary policy, to the point that an increase in interest rates can have a perverse effect on inflation. We have shown that credit risk reinforces the possibility that a vicious circle might arise, making the fiscal constraint on monetary policy more stringent.

Having analysed the recent experience of Brazil, we believe that we have identified an interesting episode where this could have happened. But the episode also shows how critical the behaviour of fiscal policy is. The economy could have fallen into a bad equilibrium, where fiscal policy would have hindered the effectiveness of monetary policy. But a small change in the fiscal stance in January 2003, coupled with a change in investors' perceptions of long-run fiscal policy, appears to have been sufficient to bring the economy back to normal conditions, stabilising the EMBI spread, the exchange rate, and, through these two variables, inflation expectations, inflation and the dynamics of the public debt.

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The optimal rate of inflation: an academic perspective

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In an economy free of all imperfections, inflation should be slightly negative. Prices should keep dropping, at the real rate of interest. Any higher rate of sustained inflation (or lower deflation) would reduce the benefits from holding real money. Central banks typically aim for modest positive inflation, however.

This article explores five types of imperfection: inertia in nominal prices, the need for distorting taxes, market power for retail banks, the value of the option to cut nominal interest rates in bad times, and menu costs. It concludes that the combined effect of these imperfections is in practice likely to justify a small positive rate of inflation.

Introduction

A large and growing number of central banks target inflation. Sometimes the central banks themselves set their own inflation targets. Others are given them by government. No inflation targets, anywhere, are negative. Yet several economists argue that what monetary authorities should aim for is price deflation negative inflation—at the real rate of interest. This paper explores this recommendation (in the next section) and then considers five arguments against obeying it. It concludes that a low rate of positive inflation is probably best.

The case for price deflation at the real rate of interest

Everyone would agree that you can easily have too much inflation. But there is often disagreement about how much is 'too much'. For some people, all inflation is simply bad, so we should aim to eliminate it. For others 'too much' might mean something in excess of perhaps 2% or 3% per year. Economic analysis gives us, however, a strong (if controversial) case against both these views, which is actually in favour of price deflation. That case is described in this section; later sections consider challenges to it.

In an otherwise perfect economy, any good should be priced at its marginal cost. Define money as currency, and its 'price', the opportunity cost of holding it, as the nominal rate of interest, for example on a treasury bill. It follows that the nominal rate of interest should be zero. At this point, the quantity of money is at its optimum; attaining this means arranging for prices to fall at the real rate of interest.

Money is held because it is useful. It is often feasible to trade and transact without money, but not always convenient. Valuable resources would be squandered. Trading partners would have to be sought out, relative

⁽¹⁾ I am most grateful to the Trustees of the Houblon-Norman Fund, who generously funded the research on which some of this paper is based; Francesco Giavazzi for valuable discussions; and participants at the 2003 MMF Conference at Cambridge, and at department seminars at Makerere, Melbourne and Witwatersrand universities, for helpful comments.

⁽²⁾ The Houblon-Norman Fund, a registered charity, was created in 1944 in commemoration of the Bank's 250th anniversary. It was named after Sir John Houblon, the first Governor of the Bank and Montagu Norman, the retiring Governor in 1944. Fellowships are awarded 'to promote research into and disseminate knowledge and understanding of the working, interaction and function of financial business institutions in Great Britain and elsewhere and the economic conditions affecting them.' George Fellowships were established within the Fund in June 2003, in recognition of the life-long achievements and service to the Bank of Sir Edward George and in particular his role as the first chair of the Monetary Policy Committee. The Houblon-Norman/George Fund is administered by Trustees, on the advice of an expert Committee. Senior Fellowships are awarded to distinguished researchers who have established a reputation in their field. Fellowships are also available for younger post-doctoral or equivalent applicants.

prices negotiated, and awkward inventories carried. The chief resource all this would take is surely the time that would be sacrificed—time that would otherwise have been applied to leisure or rewarding work.

If money is useful, and takes the form of token or fiat currency, which costs next to nothing to produce, surely households and firms should be encouraged to hold as much of this useful asset as they could possibly want? But the benefits from this asset depend upon its real value, not its paper quantity. Maximising the stock of real currency certainly does not imply that paper money should be expanded fast: if anything, the reverse. If the marginal cost of providing real money is negligible, as is widely assumed, currency should ideally be a free good.

If there is any good or service in the economy that is not priced at its marginal cost, it is possible, in principle, to reallocate resources so that everyone can gain. So, in that sense, prices that differ from marginal cost can only signify waste. The 'price' of holding real money is the nominal return that its holder could have earned instead on an alternative (riskless) asset, such as treasury bills. Making money costless to hold would therefore mean making the nominal rate of interest zero on such alternatives. It would encourage people to hold as much (real) money as they would like, with all the advantages this would bring in the form of greater convenience, security, production and trade.

Nominal interest is the sum of two elements: real interest, which should normally be positive, at least in the long run, and expected inflation. So bringing the nominal interest rate down to zero means creating a monetary framework where prices are expected to keep declining. The rate of that decline would be the real rate of interest.

Cutting the rate of inflation from something positive down to zero would benefit the holders of money, and hence society in general. Lucas (2000, 2003) calculates that the gain from reducing annual inflation at 10% to zero, in a modern economy such as the United States, is equivalent to about 1% of total consumption. In addition to a variety of other effects, many of them harmful, inflation wastes resources—most obviously, labour time—which could be put to better use. For the British economy, recent estimates by Bakhshi, Martin and Yates (2002) point to a rather smaller number than Lucas's estimate. But the logic of the above argument is that getting rid of inflation would not in fact be going far enough. It would be better still to reduce inflation further, to the point where prices were expected, on average, to trend downwards at the real rate of interest. Only then would the benefits from holding money be exploited to the full.

The damage that a small positive nominal interest rate will do is negligible. But a large one will do great damage. Roughly speaking, the cost of departing from the ideal of a zero nominal interest rate is often thought of as increasing with the square of the nominal interest rate. If so, a nominal interest rate maintained in perpetuity at 16% would do about 16 times more damage than one kept at 4%. Mild inflation is a very minor irritant, therefore; but high inflation is costly.

The rate of inflation varies over time, and also across the vast range of goods and services bought and sold. The focus in this paper will be on the long-run average rate of inflation. In general, published measures of inflation often tend to overstate the true rate of inflation. There are a number of reasons for this, among them failure to correct for substitution towards goods that have fallen in relative price, and insufficient allowance for quality improvements. Measurement problems can be serious in some economies. In the United States, for example, the Boskin Report (1996)⁽¹⁾ found that the 'true' rate of inflation could be 1% or so below the headline figure. If it were, a 'true' inflation target of x% would be achieved when headline inflation exceeded *x*. But the gap between an annual inflation target of say 2.5%, and price deflation at the real interest rate (perhaps 3%), is far greater than this. That implies that inflation measurement issues are modest when compared with a gap of some 5% or more.

The main argument sketched out above was first proposed by Milton Friedman (1969).⁽²⁾ His call for prices to fall at the real interest rate is known as the 'Full Liquidity Proposition'. It has provoked voluminous research, surveyed (and extended) recently by Lucas (2000).⁽³⁾ Most of this research confirms Friedman's claims—at least within the confines of an idealised, simple, perfectly competitive economy, free from frictions and distortions such as monopoly,

⁽¹⁾ See also Boskin et al (1998), Deaton (1998) and Diewert (1998).

⁽²⁾ In his practical policy recommendations for the United States, Friedman in fact recoiled somewhat from the logic of his argument, and limited himself to urging a policy of money growth targets expected to deliver zero inflation, not negative inflation.

⁽³⁾ Woodford (1990) is the author of an extensive earlier survey.

uncertainties, price rigidities, the costs of changing nominal prices ('menu costs'), markets that fail to clear, and taxation that impairs economic efficiency.

The key question for policy-makers is how far these various complications qualify or undermine the applicability of Friedman's proposals to contemporary economies. Do the market imperfections mean that prices should decline more slowly than the real rate of interest? Might zero inflation be best? Or is at least a modicum of positive inflation the proper objective? Many central banks now try to target inflation, implicitly or explicitly; but their inflation targets are invariably positive. Why is this? Is it correct? What are the arguments for a positive rate of inflation, and how strong are they?

What all the arguments against adopting a goal of price deflation have in common is that each rests on some form of market imperfection. There are five main arguments:

- markets fail to clear continuously, especially if there is excess supply, and a background of mild inflation may improve resource allocation;
- (ii) public finance considerations, stemming ultimately from some type of market failure, mean that it is quite possible that money should in effect be taxed;
- (iii) making currency less attractive to hold can undo some of the damage caused by the exercise of market power in the retail banking sector;
- (iv) occasional recessions, which are symptoms of macroeconomic market failure, need to be countered by nominal interest rate cuts, and, since nominal interest rates cannot be negative, it makes sense for nominal interest rates normally to be positive, in order to create room to cut them if necessary; and
- (v) many firms opt to hold prices for long periods, which points to a degree of market power and systematic overpricing, which mild inflation may reduce.

Each of these arguments will be explored in turn in the five sections that follow.

Inflation helps markets to clear more quickly

Argument (i) starts with the notion that wages and prices are sticky downwards. That means that any excess supply tends to persist. Since it is real prices that are too high, and the source of the problem, disequilibria are removed faster if other prices are climbing, rather than flat or falling.

When applied to labour markets, this view could suggest a negative relationship between the rate of inflation and the average level of unemployment, and possibly one where that negative association persists. Most observers have long concluded that any benefits from raising the rate of inflation were fleeting and trivial, in comparison with the problems created (and also, perhaps, with the cost of reversing it). Yet, no matter how clear the evidence that annual inflation does great damage above, say, 3% or 5%, it does not follow that macroeconomic stability is more imperilled by inflation in the 1% to 3% range, than by price deflation at the real rate of interest. Inflation could be a terrible curse at rapid rates, and yet actually a modest blessing at low ones.

Does evidence bear this out? Akerlof, Dickens and Perry (1996, 2000) argue that, for the reasons given above, modest inflation may lower long-run unemployment, while the uncertainties that accompany rapid inflation may increase it. They find US evidence to be broadly consistent with this view: for them, the unemployment-minimising rate of annual inflation appears to be somewhere between 1.5% and 4%.⁽¹⁾ Wyplosz (2001) looks at data for France, Germany, the Netherlands and Switzerland. He concludes that unemployment is not completely independent of the rate of inflation, and some of the results tally with the view that a little inflation helps to cut unemployment, and not just temporarily. But his conclusion is that 'we do not know yet how high inflation should be'. Even if we could be sure that there was an inflation range that minimised unemployment in a particular economy in a particular period of time, there are many reasons⁽²⁾ why we could not necessarily extrapolate that to other economies or periods.

The public finances

The second riposte to Friedman's Full Liquidity Proposition, due originally to Phelps (1973), runs thus.

⁽¹⁾ There is also other evidence testifying to a negative long-run link between inflation and unemployment in the United States: for example, Fair (2000) and King and Watson (1994). On the broader issues of Phillips curve non-linearities and whether wage and price nominal rigidities become more serious as inflation falls, Yates (1998) provides a very comprehensive survey.

⁽²⁾ Most obviously the Lucas Critique argument: behaviour depends on policies pursued.

A positive nominal interest rate is a distortionary tax on real holdings of currency. But other taxes, on income, profits, sales or value added for example, are distortionary too. Is money really so special that it should qualify for the privilege—a unique privilege, perhaps—of tax exemption? It is only lump-sum taxes that do not distort; and equity or feasibility⁽¹⁾ considerations will rule them out. So if public goods and transfers and public debt service have to be financed by wasteful, distortionary taxation, should money holdings really go untaxed?

Governments may have large revenue needs, entailing serious distortions throughout the economy. Taxing money can alleviate these distortions a little. It also offers a means for taxing informal-economy transactions, which are mostly conducted by cash. On the other hand, taxing money tends to hurt the poor relatively more than the rich, and taxing the money people need to pay for taxed goods out of taxed income amounts to double taxation. Unless the government's revenue requirement was very large—and even if it were—a social planner may balance accounts better by relying solely on other revenue sources, such as income tax.⁽²⁾

Market power in retail banking

The third argument for not making prices trend down at the real rate of interest is based upon the view that the market for retail bank deposits may not be perfectly competitive. This is simply a hypothesis—there is no suggestion that this is in fact the position in the United Kingdom today.

As Edgeworth (1888) was the first to argue, the costs of operating the payments system, clearing cheques, evaluating alternative assets and holding prudential reserves tend to make banking an industry where suppliers enjoy increasing returns. That implies there will probably be room for just a few, large retail banks. Further, if banks aimed to maximise profit,⁽³⁾ they would exploit their monopsony power by underremunerating deposits.

One answer to this is regulation. Banks could be forced to pay more to depositors, for example, and to charge less for loans. But such a policy has the drawback of ultimately weakening banks' balance sheets, raising the likelihood of failure and systemic financial instability.

So another option is to levy a small tax on currency. Currency is a close but imperfect substitute for bank deposits. If bank deposits are too low from a welfare standpoint, and cannot be raised safely by direct means, then a tax on their substitutes is appealing. It would raise the volume of bank deposits. That should bring a first-order gain to social welfare (assuming no adverse repercussions elsewhere) and only second-order welfare losses due to reduced currency holdings, so long as the tax on currency is low. Furthermore, such a small tax on currency would also strengthen banks' balance sheets and reduce risks of bank failure. This counterargument to Friedman's Full Liquidity Proposition, which is explored in Mullineux and Sinclair (2003), is a straightforward application of the Theory of the Second Best to a hypothetical case where banks behave as Edgeworth argued long ago they could.

Preserving room for manoeuvre in monetary policy

The fourth argument against Friedman's call for price deflation at the real interest rate rests on three propositions:

- (a) the official, central bank nominal interest rate is the key lever of monetary policy;
- (b) the nominal interest rate can never be negative; and
- (c) unforeseeable shocks sometimes make it right to engage in expansionary monetary policy.

Adherence to Friedman's Full Liquidity Proposition means setting nominal interest rates at zero. Together, (a), (b) and (c) imply that the central bank has closed any option to engage in temporary monetary relaxation, should circumstances appear to warrant it. Squeezing demand is still available, because this entails a temporary rise in the policy rate. Proposition (b) imposes a floor on that rate, not a ceiling. But loosening policy is impossible, if the nominal interest rate is already at the floor. It is precluded, at least, if the central bank employs its standard device—a temporary cut in the policy rate.

⁽¹⁾ Truth-telling issues: lump-sum taxes increasing with earning ability reported to the tax authority would, for example,

tempt the able to lie. (2) If income tax rates were non-linear, as urged in the pioneering paper by Mirrlees (1971), it turns out that the

conditions under which money should be taxed for fiscal reasons become even more stringent.

⁽³⁾ With at most limited powers of price discrimination, and immune from the threat of entry.

What gives this observation special significance is the fact that models of the macroeconomic short run relate aggregate demand positively to the rate of expected inflation. Buyers tend to bring purchases forward if prices are expected to climb. Expectations of price declines encourage them to wait. So in the very circumstances when monetary reflation may be most needed—positions of exceptionally weak aggregate demand—Friedman's Full Liquidity Proposition appears to preclude it. To some, the last steps of the route to a zero nominal rate start to look like a one-way street. The nub of the argument is that a central bank should aim to keep nominal interest rates well inside positive territory, in order to preserve the option of cutting them if and when necessary.

This pessimistic view may be rather overdrawn. Proposition (a) is open to challenge. Even if and when the policy rate is zero, the central bank can reflate in other ways. It could conduct open market purchases of longer-dated bonds that still carry positive nominal redemption yields, or of equities, or foreign exchange.⁽¹⁾ Furthermore, when close to Friedman's optimum, but not quite there, the authorities might, as Ueda (2002) discusses, lengthen the duration for which nominal interest rates are cut. This would compensate for the fact that the size of the cut is smaller than it would have been without the zero bound. Or, as Eggertson and Woodford (2003) argue, policy should aim, in such circumstances, at raising the expected price level for some later date. Finally, as Yates (2003) discusses, there are several possible devices that might, one day, allow a central bank to set a temporarily negative yield on cash.

Nonetheless, to the extent that (a), (b) and (c) do hold under present conditions, they do at least constitute a case for less price deflation than Friedman's rule implies, and maybe for zero or even positive inflation. The gain, presumably a diminishing one at the margin, from moving towards Friedman's optimum has to be set against the cost of reducing, and in the limit eliminating, the option to reflate, should the need arise, with the standard medicine of an interest rate cut. The greater the chance of adverse demand shocks calling for that medicine, the greater the value of the option.

Menu costs

Menu costs are the real costs of changing nominal prices.⁽²⁾ They represent an imperfection in the sense that they impede the flexibility of prices. If one wished to pursue a monetary policy that minimised the average incidence of menu costs, the overall rate of inflation would be zero.

Menu costs do not imply, however, that zero inflation is ideal. There are three reasons for this. First, other factors need to be taken into account. The gains from price deflation at the real interest rate, which Friedman emphasises, the subject of the second section, are one such.⁽³⁾ Second, if menu costs are present, and help to explain the widespread phenomenon of nominal price rigidities at low rates of inflation, it is not easy to think in terms of perfect competition. Perfect competitors are price-takers. It is more natural to treat firms that face costs of changing prices as price-setters. And, as we saw with banks, the power to set prices may well lead to overcharging and hence to underprovision. In an otherwise perfect economy, it must, assuming profit is maximised, price discrimination limited, and entry blocked. The third key issue is the fact that the real rate of interest is typically positive. That means that firms care more about real profits this month (or year) than next.

Suppose a firm with monopoly power knows the rate of overall inflation, and knows it is constant. If there were no menu costs, and its nominal marginal cost kept rising at that rate, so would its (profit-maximising) nominal price.⁽⁴⁾ But menu costs would make a policy of continuous tiny price increases prohibitively expensive. Instead, the nominal price of its product would be raised by a discrete proportion infrequently, and remain fixed between revisions. With both demand and marginal cost steady in real terms, and all other things being equal, steady inflation would make the interval between those revisions constant. The firm would presumably choose both the size and the frequency of its nominal price changes to maximise its stream of discounted net profit.

Suppose that the interval between price changes was one year, when the rate of inflation and the real interest

⁽¹⁾ As urged for example, among others, by McCallum (2000).

⁽²⁾ Early contributions to the literature on menu costs are Barro (1972) and Sheshinski and Weiss (1977). The main focus here was positive, not normative. Diamond (1993) constructs a search model where the real interest rate is positive, and finds that, with monopoly, optimum inflation is strictly positive, because it tends to force monopolists to charge less on average in real terms. What follows in this section is a simplified account of Sinclair (2003) which confirms Diamond's conclusion in a menu cost setting.

⁽³⁾ For even if Friedman's argument for price deflation goes too far, as the logic of the present paper suggests, his insights about the welfare costs of inflation remain valuable. As King (2002) stresses, above some rate, inflation is indubitably damaging.

⁽⁴⁾ Assuming that the elasticity of demand for the firm's product is constant.

rate were both 3%. For the first six months or so, the firm would be charging more, in real terms, than the price it would have set to maximise profit in the absence of menu costs. Later on, it would be undercharging from the standpoint of maximum profit, in this sense.

This is where discounting (the real interest rate) comes in. What it loses from initial overpricing would receive more emphasis than losses from the opposite later. That means inflation should reduce its average real price somewhat. If so, on average, it would therefore produce more. On average, the price would come closer to its socially ideal value of marginal cost. This effect is strongest when the inflation rate is positive and very small, since the interval between price revisions would then be very long.

If inflation were a very small negative number, however, we would also see very infrequent price revisions. But the timing order of losses due to overpricing and underpricing would now be reversed. Negative inflation means that the real price drifts up over time between price revisions, not down. So early on the firm would see it was charging too little in real terms. So it would tend to react by raising its average real price, and therefore, on average, producing less. In an otherwise undistorted economy, first-order welfare losses would follow, amplifying the deadweight cost of monopoly.

These gains and losses from altered average real prices set by monopolists now need to be combined with the menu costs themselves (which are minimised at zero inflation) and Friedman's benefits from real money holdings (maximised when inflation is minus the real rate of interest). If the last of these were sufficiently modest, the optimum rate of inflation would be unambiguously positive. When the opposite is true, inflation should be negative, at (or quite close to) the real interest rate. In either case, a very slightly negative inflation rate could only be harmful, quite as bad for welfare as a rapid, positive inflation rate.

This fifth counterattack on Friedman's Full Liquidity Proposition is in fact the only one that establishes, under specified assumptions,⁽¹⁾ that small positive inflation is superior to small negative inflation. The figure above presents two possible relationships between

Figure 1 Costs and benefits of inflation



welfare and the percentage rate of annual inflation. One, the solid curve, coloured green, depicts the case when the 'shoe leather' cost⁽²⁾ of departing from Friedman's ideal, maximum level of real money is quite modest. In this case welfare peaks at a positive inflation rate. The broken curve, coloured red, holds when these shoe leather costs are so massive that Friedman's Full Liquidity Proposition remains best.

The blue curve represents 'benefits'. It captures the firm's average profits, net of menu costs, and, in addition, the consumer's average surplus (the monetary difference between the utility gained from consuming the good, and what the consumer actually pays). The curve peaks at a slightly positive inflation rate, and reaches its minimum when inflation is slightly negative. The blue curve is continuous. But at relatively high and low rates of inflation, when price adjustments become more frequent, benefits tend to be less than they would be if inflation were zero, and the blue curve, as drawn, reflects this.

Society's *net* benefit at the Friedman optimum is AB. This is less than the distance DE (which represents net benefits with the green shoe leather curve), but greater than the (negative) distance DF (which gives net *cost* with the red curve). Looking at the negative inflation region, there are several factors that make up the shape of the benefit curve. A very low rate of price deflation implies a very long interval between nominal price cuts,

⁽¹⁾ These assumptions include horizontal marginal cost, linear (or constant-elasticity) demand, constant and known rates of inflation and real interest, and a continuum of similar profit-maximising monopolists, whose total price distribution moves evenly over time.

⁽²⁾ The term 'shoe leather costs' covers the direct welfare costs of raising the rate of inflation above Friedman's optimum, in recognition of the fact that much faster inflation will encourage people to shop more often, thus wearing out their shoes at a faster rate. The green and red curves are drawn as straight lines. They could be curves, but they will always slope upwards.

and therefore a powerful stimulus to the firm to raise its average real price (to society's detriment). As the rate of *deflation* increases, this effect weakens quite quickly, because price adjustments become more frequent. This is at first beneficial (because real monopoly prices slip back). But as the rate of price deflation increases, average menu costs become more serious, and the marginal reduction in monopolists' average prices fades away.

So far there is a chance that inflation should be strictly positive; but if it is, it will in fact be tiny. (For example, it would be barely one ten thousandth of 1% per year, in fact, if the demand elasticity were constant at a value of two, and prices changed annually when the rates of inflation and real interest were both 3%.) The optimum inflation rate would become appreciable, however, if we supposed that the monopolistic firms displayed a positive productivity trend. Suppose this were 4% per year, while the rest of the economy's output accounted for half of total spending, and consisted of goods produced by perfectly competitive firms who faced no menu costs and whose productivity was unchanging.⁽¹⁾

If the gains from raising real money to the Friedman optimum were small enough, it would follow that the optimum rate of overall annual inflation was close to 2%. This is because the monopolists would never have to change their nominal prices if all the other goods rose in price by 4% per year. So a rate of inflation very slightly above this (which would make price revisions very infrequent) would combine with the positive real interest rate to induce them to cut their average real prices—which were too high anyway from a welfare standpoint. If overall inflation were a little lower, however, our firms' average real prices would be higher, leading to a really sharp dip in welfare. If it were a good deal faster than 2%, benefits would fall away too, and, of course, shoe leather costs would be appreciably larger, too.

As stressed earlier, inflation is hard to measure exactly, particularly when quality is changing, new goods are being introduced, and relative price changes are inducing substitution. Productivity trends and real interest rates are also inclined to swing around, and no less open to measurement difficulty. What implication do these phenomena have? Because welfare falls away much more slowly to the right of the optimum inflation rate (assuming it is positive) than to the left, uncertainties and measurement ambiguities imply that a little overshooting is less serious than a little undershooting.

Conclusion

Many distinguished economists have argued that prices should keep falling, at the real rate of interest. No central bank, however, operates on that principle. So who is right? Negative inflation at that rate would be ideal, normally, in a perfect world. But imperfections of many kinds tend to tilt optimum monetary policy towards less deflation, or even mild inflation. Five types of imperfection have been explored. Perhaps the most telling were the last two, discussed in the previous two sections. The first of these put the case for leaving room for cuts in the nominal rate of interest when circumstances required this. In the previous section, the Friedman arguments for price deflation were pitted against a simple account of menu costs and monopoly that could not just explain the kind of price rigidities observed, but also demonstrate how and why optimum inflation could indeed be strictly positive after all.

The combined force of all five arguments is to provide a reasonable intellectual justification for the kind of monetary policies—aiming for low, positive inflation—now conducted in many countries.

The five objections to following Friedman's call for deflation at the real rate of interest that we have considered are not alternatives. Nor are they additive: it would be wrong to say 'Let us have x% inflation for this reason, and y% for that, so (x + y)% is best'. Rather, they are complementary. Taken together, these objections to price deflation, and the concerns about inflation mismeasurement, suggest that, for advanced countries at least, the case for a modestly positive rate of inflation—within the range of inflation targets currently imposed—looks decidedly a wise one.

⁽¹⁾ To make this consistent with a small general equilibrium model, Sinclair (2003) finds it simplest to assume that there is a representative shareholder-consumer, who receives all profits, and whose utility is linear in the competitive sector's goods but symmetric and concave in each of the monopolist's products (with isoelastic marginal utility), and log-linear in leisure.

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The EU Financial Services Action Plan: a guide

A Single Market in financial services has long been an EU objective. The integration of financial markets in the EU has progressed much further in wholesale than in retail financial services, with the latter still segmented largely along national lines.

The Financial Services Action Plan (FSAP) consists of a set of measures intended by 2005 to fill gaps and remove the remaining barriers to a Single Market in financial services across the EU as a whole.

This guide to the FSAP has been prepared by HM Treasury, the Financial Services Authority (FSA) and the Bank of England. The guide is intended to provide an introduction to the FSAP for the UK financial sector, corporate sector and consumer groups, where they are not yet sufficiently familiar with its potential impact, rather than for experts. The guide is being published now, because the FSAP is now in the process of being implemented.

The key points for the UK financial sector, corporate sector and consumer groups are as follows:

- The FSAP is intended to be implemented by 2005, and many measures are due to be implemented before then.
- The FSAP is important because EU legislation effectively determines UK law in this area.
- The UK financial sector, corporate sector and consumer groups will all be affected by FSAP measures, as and when they are implemented.
- The FSAP represents a competitive opportunity, even though some individual FSAP measures have not lived up to expectations, and barriers to a Single Market in financial services cannot all be removed by legislation.
- The UK authorities are keen to ensure that the UK financial sector, corporate sector and consumer groups are consulted on, and fully understand the impact of, FSAP measures.
- As new FSAP measures are adopted, the European Commission's priorities are gradually shifting to ensuring that legislation is implemented consistently and promptly at national level and properly enforced.

Introduction

This guide to the EU Financial Services Action Plan (FSAP) has been prepared by HM Treasury, the Financial Services Authority (FSA) and the Bank of England. The guide is set out in seven main sections:

- A How close are we already to a Single EU Market?
- B What is the FSAP?
- C What progress has been made in implementing the FSAP?
- (1) Based on information available at 31 July 2003.

- D How does the Lamfalussy process affect the FSAP?
- E What are the implications of the FSAP for EU regulation in future?
- F What key issues arising from the FSAP need to be addressed?
- G How does the United Kingdom make a contribution to the FSAP?

Useful sources of further information about the FSAP are provided at the end of the guide.

A How close are we already to a Single EU Market?

A Single Market in financial services has long been an objective of the European Union. In a Single Market, financial institutions authorised to provide financial services in one Member State would be able to provide the same services throughout the EU, competing on a level playing field within a consistent regulatory environment. Such a Single Market in financial services would 'act as a catalyst for economic growth across all sectors of the economy, boost productivity and provide lower cost and better quality financial products for consumers, and enterprises, in particular SMEs'.⁽¹⁾ A number of attempts have been made to estimate these potential benefits. (For examples, see the box opposite.)

Much has already been done to remove barriers to the integration of EU financial markets since the White Paper on the Single Market in 1985.⁽²⁾ In recent years, EU financial markets—and transactions across borders within the EU—have grown in size and improved in efficiency, both because of the removal of barriers and for other reasons, such as greater competition promoted by global deregulation and the development of new technology. The launch of the euro has also acted as a catalyst for some further integration.⁽³⁾

However, the integration of financial markets in the EU has progressed much further and faster in wholesale than in retail financial services, with the latter still segmented largely on national lines. Moreover, while many barriers have been removed, those that remain appear more prominent now that 12 EU countries share a single currency.

Wholesale financial markets

The unsecured euro money markets are fully integrated, with short-term euro interest rates being effectively identical across the euro markets, and a common money market reference yield curve, based on EONIA (overnight) and EURIBOR (beyond).⁽⁴⁾ They are supported by two pan-European payment systems

A Single Market in Financial Services: estimating the benefits

The Cecchini Report in 1988 put the potential increment to GDP from a fully integrated Single EU Market in financial services at 1.5%.⁽¹⁾ Two much more recent estimates have been published.

A report for the Commission by London Economics, in association with PricewaterhouseCoopers and Oxford Economic Forecasting, estimated the long-run increment to GDP as 1.1%, assessed in terms of a prospective reduction in the cost of capital.⁽²⁾ The report estimated that some EU countries had more to gain than others, but that the benefits of financial market integration were economically significant in them all.

A report for the European Financial Services Round Table chaired by Pehr Gyllenhammar, by ZEW and IEP,⁽³⁾ estimated the increment to GDP from a working European *retail* market for financial services as between 0.5% and 0.7%, depending on the country concerned, as a result of: an increase in product choice, particularly in small countries; lower prices for retail financial services; lower interest rates; and a reduction in the 'home bias' in private investors' portfolios.⁽⁴⁾

- Cost of non-Europe in Financial Services (1988).
 Quantification of the Macro-economic Impact of Integration of EU Financial Markets (November 2002).
 Zentrum für Europäische Wirtschaftsforschung and Institut für Europäische Politik.
- (4) The Benefits of a Working European Retail Market for Financial Services (February 2002).

(TARGET and EURO1),⁽⁵⁾ which enable

euro-denominated payments to be made in real time across borders within the EU. As a result, commercial banks can effectively manage euro liquidity so as to obtain efficiency savings and cost benefits. And since the launch of the euro, dealing spreads have narrowed in the money, swap and foreign exchange markets involving the euro.

⁽¹⁾ Conclusion of a discussion among Economy and Finance Ministers, the ECB President and Governors of National Central Banks, at the informal ECOFIN meeting in Brussels in April 2002, on a report on *Financial Integration*, drawn up by a Working Group of the Economic and Financial Committee (EFC). The EFC consists of EU finance ministry and central bank officials, who prepare meetings of ECOFIN. The Working Group was chaired by Kees van Dijkhuizen, Treasurer General of the Netherlands Ministry of Finance.

⁽²⁾ The original date for completion was 1992.

⁽³⁾ HM Treasury, The Location of Financial Activity and the Euro: EMU study (June 2003).

 ⁽⁴⁾ EONIA is the Euro OverNight Index Average. EURIBOR is the Euro Interbank Offered Rate.
 (5) The Trans-European Automated Real-Time Gross Settlement Express Transfer system (TARGET) links the 15 euro-denominated RTGS systems in the EU and the ECB payment mechanism, to provide an EU-wide RTGS system.

EURO1 is the Euro Banking Association's net settlement system.

In many other respects, the wholesale financial markets in euro are already closely integrated, though some barriers remain:

- Bond trading Government bonds are increasingly traded on a pan-European basis, supported by the emergence of electronic platforms (in particular, BrokerTec and EuroMTS), though many non-government bonds are still traded over-the-counter. Along the yield curve for government bonds by EU issuers, there are only relatively small differentials, which reflect the market's perception of differences in liquidity and credit risk.
- Bond settlement Most government bond transactions can be cleared through a central counterparty, and settled in Euroclear or Clearstream. Where bonds are available only in their domestic depository, differences in systems and delivery deadlines mean that they cannot be used as cross-border collateral as quickly or easily. As a result, the repo market is not yet fully integrated across borders.
- *Equity trading* Equity trading still takes place predominantly on national exchanges, partly because national listing rules for equities are complex and in some countries specifically require stocks to be traded on national exchanges. However, the role of national exchanges has been changing, through: an increase in international listing and trading; mergers and alliances between exchanges; the emergence of electronic platforms with cross-border access; and growth in remote membership.
- *Equity settlement* The costs of settling purely domestic equity transactions in Europe are competitive by international standards. But the costs of settling equity transactions across borders are typically a good deal higher, because of additional complexity, such as the need to cope with different legal and technical systems.
- *Remote access* In principle, market firms can trade remotely on trading platforms across the EU from a single location. In practice, some market firms are concerned about national rules which effectively require them to maintain local presences and use local trading or settlement systems.

• *Cross-border investment* There is some evidence of an increase in investment across borders, using pan-European rather than national benchmarks, though a 'home bias' remains.

Retail financial services

While many wholesale financial services are provided on a pan-European basis, retail financial services in the EU are still segmented largely along national lines. The main barriers to the integration of retail financial services include the following:

- *Type of product* Some products authorised in one country (eg interest-bearing current accounts) cannot yet be provided in all the others.
- *Cost* The cost of local registration and compliance with regulatory or marketing requirements (eg in the case of mutual funds) can, on occasion, be prohibitive.
- *Tax* The local tax system may differentiate between local and foreign products (eg in the case of pension contributions across borders).
- Preference Cultural preferences differ across the EU. Many consumers prefer familiar domestic products, with information in their own language, and easy and direct access to the product provider. For example, the mortgage market differs significantly between the United Kingdom and the rest of the EU.
- *Delay* Authorisation of foreign products may be delayed, sometimes more or less explicitly, until local firms can compete.
- *Regulation* While most Member States have adopted a mixed approach to regulation, a broad distinction can be drawn between those which have traditionally focused on the regulation of products and those which have tended to focus on the regulation of sales/providers, though this situation is changing.
- *Redress* The arrangements enabling consumers to obtain redress across borders are still at a very early stage of development.

Reflecting the segmentation of retail financial services in the EU along national lines, there have so far been few sizeable retail bank mergers across borders. The main examples include Fortis in 1990, Dexia in 1996, Nordea in 1998, HSBC's acquisition of CCF in 2000 and Barclays' acquisition of Banco Zaragozano in 2003.⁽¹⁾ Significant hurdles need to be overcome: local customers tend to identify with local banks; and differences persist in national consumer and competition laws. By contrast, there have been many more domestic retail bank mergers, where overlapping branch networks also make the scope for cost savings much greater.

B What is the FSAP?

In June 1998, the Cardiff European Council invited the European Commission to table a framework for action to develop the Single Market in financial services. In May 1999, the Commission published a Communication containing a Financial Services Action Plan, which was endorsed by the Lisbon European Council in March 2000. The FSAP relates to a Single Market across the EU as a whole.⁽²⁾ It consists of a set of measures intended by 2005 to fill gaps and remove remaining barriers so as to provide a legal and regulatory environment that supports the integration of EU financial markets.

Within the overall objective of completing the Single Market in financial services, the FSAP has the following specific objectives:⁽³⁾

- *a single wholesale market*: to enable corporate issuers to raise finance on competitive terms on an EU-wide basis; to provide investors and intermediaries with access to all markets from a single point of entry; to allow investment service providers to offer their services across borders without encountering unnecessary barriers; to establish a sound and well integrated prudential framework for investment by fund managers; and to create a climate of legal certainty so that securities trades and settlement are safe from unnecessary counterparty risk;
- *an open and secure retail market*: to give consumers the information and safeguards they need to participate in the single financial market; to remove unjustified barriers to the cross-border provision of retail financial services; to create the

legal conditions for electronic commerce on a pan-European scale; and to enable consumers to make small-value cross-border payments without excessive charges; and

• *state-of-the-art prudential rules and supervision.*

The FSAP covers a wide range of measures. Wholesale measures relate to: securities issuance and trading; securities settlement; accounts; and corporate restructuring. Retail measures relate to: insurance; savings through pension funds and mutual funds; retail payments; electronic money; and money laundering. And there are other measures relating to: financial supervision; corporate insolvency; and cross-border savings (see the box on pages 356–57).

Some FSAP measures take the form of EC Regulations, which apply directly in all Member States. Most take the form of EC Directives, which have to be transposed into the law of each Member State.⁽⁴⁾ Of these, some replace earlier Directives (eg on investment services), which are now out of date, while others recast earlier proposals (eg on takeover bids) which failed to gain acceptance. Some measures on the FSAP list (eg on mutual funds) were already under negotiation when the FSAP was launched; others have been added to the list since it was launched.

The normal procedure for legislative measures (ie Regulations and Directives) in the FSAP is that they are proposed by the Commission and adopted by 'co-decision', under which the Council of Ministers of the Member States⁽⁵⁾ and the European Parliament both need to consider, amend and agree on the final content of each legislative proposal. Both Regulations and Directives have to be published in the *Official Journal*, and come into force on a specified date. Member States are given a period (usually of 18 months) to implement Directives, by transposing the provisions into their national law.

C What progress has been made in implementing the FSAP?

Of the 42 original measures in the FSAP, 36 have now been finalised; 3 are under negotiation; and 3

⁽¹⁾ Fortis and Dexia involved banks in Benelux; Nordea in Scandinavia; HSBC/CCF in the United Kingdom and France; and Barclays/Banco Zaragozano in the United Kingdom and Spain. Some (eg HSBC) have retained the local brand name, while using the Group logo.

⁽²⁾ Since 1 January 1994, most Single Market legislation has also applied in the rest of the European Economic Area (Norway, Iceland and Liechtenstein).

⁽³⁾ European Commission, Financial Services: Implementing the Framework for Financial Markets: Action Plan (May 1999).

⁽⁴⁾ The others mainly consist of Commission Communications and Recommendations.

⁽⁵⁾ The Council decides on FSAP measures (apart from tax) by qualified majority voting.

FSAP measures

The main FSAP and related measures can be summarised as follows:

Securities issuance and trading

- The Market Abuse Directive of January 2003 harmonises rules on the prevention of insider dealing and market manipulation in both regulated and unregulated markets. It is due to be implemented by October 2004.
- The Prospectus Directive, which was adopted in July 2003, is designed to provide a 'single passport' for issuers of equity and debt securities so that, once an issue of securities meets prospectus requirements in one country, the securities can be sold across the EU. It is expected to be implemented by May 2005.
- A revision to the Investment Services Directive was proposed by the Commission in November 2002. This is due to replace the 1993 Directive, which regulates the authorisation, behaviour and conduct of business of securities firms and markets, including exchanges.
- The Transparency Directive, which was proposed by the Commission in March 2003, is set to impose an obligation on issuers to meet continuing disclosure requirements after issue.

Securities settlement⁽¹⁾

- The Settlement Finality Directive of May 1998, which aims to reduce systemic risk in payment and securities settlement systems, in particular the risk of the insolvency of a participant, was implemented under the FSAP by December 1999.
- The Collateral Directive of June 2002 provides greater legal certainty about the validity and enforceability of collateral backing transactions across borders. It is due to be implemented by December 2003.

Accounting

• The Fair Value Accounting Directive of May 2001 brings up to date existing EU accounting Directives for companies, banks and other financial institutions, on the valuation of assets at methods other than purchase price and cost. It is due to be implemented by January 2004.

- The Regulation of July 2002 endorsing International Accounting Standards proposes that a single set of international accounting standards will apply to all listed companies across the EU for each financial year starting on or after 1 January 2005.
- The Accounting Modernisation Directive, which was adopted by the Council in May 2003, amends the Fourth and Seventh Company Directives. It is due to be implemented by January 2005.

Corporate restructuring⁽²⁾

- The European Company Statute (ECS) consists of a Regulation of October 2001 enabling companies in the EU to set up under a European charter, so that they do not need to register in a number of different countries, together with a Directive on employee involvement. The Regulation will have effect from, and the Directive is due to be implemented by, October 2004.
- The Takeover Bids Directive, which was proposed by the Commission in October 2002 in place of an earlier Directive on which agreement was not reached, proposes a minimum framework for the national approval of takeovers, including applicable law, protection of shareholders and disclosure.
- New Commission proposals for 10th and 14th Company Law Directives are expected in early 2004.

Insurance

- The Directive of November 2000 amending the Insurance Directives and the Investment Services Directive permits information exchange with third countries. It had to be implemented by November 2002.
- Two Directives of March 2002 update solvency standards for life and non-life insurers. and a scheme is being considered for the protection of policy holders. The two Directives are due to be implemented by September 2003.⁽³⁾
- The Insurance Mediation Directive of December 2002 introduces an EU framework for the

(c) The Commission is also proposed in May 2003 an Action Plan on Modernising Company Law and Enhancing Corporate Governance in the EU, based on the recommendations in the Winter Report on corporate governance, and priorities for improving statutory audit. However, this is not part of the FSAP.
(3) The Commission is also hoping to present a Framework Directive, Insurance Solvency II, by early 2005, and is working on Insurance Guarantee Schemes

⁽¹⁾ The Commission is also proposing to adopt a Communication this autumn on improving the efficiency of clearing and settlement of cross-border

authorisation, capitalisation and regulation of intermediaries and brokers who sell insurance products. It is due to be implemented by January 2005.

• A Commission proposal is also expected around the end of 2003 to harmonise the framework for reinsurance supervision in the EU.

Long-term savings

- Two UCITS Directives of January 2002 amend earlier (1985) Directives by liberalising the types of asset in which UCITS (ie mutual funds) can invest, and regulating management companies and the production of simplified prospectuses. They are due to be implemented by February 2004.
- The Distance Marketing Directive of September 2002 governs conditions on the sale of retail financial services products, if they are not sold face-to-face. It is due to be implemented by October 2004.
- The Pension Funds Directive of May 2003 regulates the operation of employment-related pension schemes across borders in the EU. This is based on mutual recognition of home state regulation, and establishes a 'prudent person' approach in Community law, so that a prudent investment policy can be followed for scheme members in each Member State. It is due to be implemented by August 2005.

Retail payments

• The Commission is also expecting to publish a Communication on the EU Legal Framework for Payments in the Internal Market, which aims to rationalise existing EU legislation on retail payments, and propose legislation around the end of 2003.

Electronic money

- The E-Money Directive of September 2000 defines electronic money and governs the capital and authorisation requirements for a new category of electronic money institution. It had to be implemented by April 2002.
- The Electronic Commerce Directive of June 2000 aims to create a legal framework for the free movement across the EU of electronic commerce, including financial services. It had to be implemented by January 2002.

Money laundering

- The Second Money Laundering Directive of December 2001 extends the scope of predicate offences for which reporting of suspicious activity is mandatory, and broadens the regulated sector to include new professions, such as solicitors and accountants, and activities, such as casinos. The regulations in the United Kingdom are expected to be laid down in September 2003.
- A proposal from the Commission for a Third Money Laundering Directive is expected by the end of 2004.

Financial supervision

- The Financial Conglomerates Directive of December 2002 determines how the lead supervisor of a financial conglomerate should be decided and ensures that gaps in supervisory arrangements are filled. It is due to be implemented by August 2004.
- A proposal from the Commission for a Risk-based Capital Directive is expected in 2004 to implement in the EU the capital framework for banks and investment firms planned in the revised Basel Capital Accord. While the Basel Capital Accord will apply only to internationally active banks, the Risk-based Capital Directive is expected to apply to all banks and investment firms.

Corporate insolvency

- The Insurance Winding-up Directive of March 2001 ensures that the principle of mutual recognition is applied to the winding-up and reorganisation of insurance undertakings in the EU. It had to be implemented by April 2003.
- The Bank Winding-up Directive of April 2001 ensures that banks can be wound up and reorganised in the EU as a single entity. It is due to be implemented by May 2004.

Taxation of savings income

• The Taxation of Savings Income Directive, adopted in June 2003, is designed to prevent cross-border tax evasion by individuals within the EU. It provides for Member States to exchange information on interest income paid to non-residents, or (in Austria, Belgium and Luxembourg) to tax that income at source, with equivalent treatment in Switzerland and the dependent territories. It is due to be implemented by January 2004, with the provisions applying from January 2005. proposals have still to be made.⁽¹⁾ The final date for adoption at EU level is mid-2004, allowing 18 months for transposition by the deadline of the end of 2005 (see the box on pages 356–57).

An expected timeline for key FSAP Directives outstanding is shown in Chart 1. They are divided into three categories: measures which have not yet been proposed; measures which have been proposed but not yet adopted; and measures which have been adopted but not yet implemented.

D How does the Lamfalussy process affect the FSAP?

Given the scale⁽²⁾ of the task involved in adopting and implementing such a large programme of FSAP Regulations and Directives, ECOFIN decided in July 2000, as its top priority, to complete a single EU capital market by 2003. A Committee of Wise Men chaired by Baron Alexandre Lamfalussy was appointed. The Lamfalussy Committee recommended a new decision-making procedure for the adoption of EU legislation affecting the securities markets, which was endorsed by the Stockholm European Council in March 2001.⁽³⁾

The Lamfalussy process is designed to improve the quality and effectiveness of EU financial services legislation by: differentiating between framework legislation (at Level 1) and technical implementing measures subject to 'comitology' (at Level 2), so that changes in technology and market practice can readily be accommodated; consulting market participants more fully as it is drawn up; and creating an EU network of national regulatory authorities to ensure consistent and

Chart 1

Expected timeline for key FSAP measures outstanding

20	003	2004			2005				
Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
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■ Plan for proposal ● Plan for adoption ◆ Deadline for implementation

Source: Based on information available at 31 July 2003.

⁽¹⁾ The Commission's *Eighth Report* on the FSAP (3 June 2003), updated. Legislative proposals on the original FSAP list under negotiation: Takeovers; Transparency; Investment Services. Legislative proposals on the original FSAP list still to be made: 10th and 14th Company Law; Risk-based Capital.

⁽²⁾ The Initial Report of the Committee of Wise Men on *The Regulation of European Securities Markets* (November 2000) says: 'it takes three years on average to agree a Regulation or a Directive'.
(3) The priorities recommended in the Final Report of the Committee are: 'a single prospectus for issuers, with a

⁽³⁾ The priorities recommended in the Final Report of the Committee are: 'a single prospectus for issuers, with a mandatory shelf registration system; modernisation of admission to listing requirements and introduction of a clear distinction between admission to listing and trading; generalisation of the home country principle (ie mutual recognition) for wholesale markets, including a clear definition of the professional investor; modernisation and expansion of investment rules for investment funds and pension funds; adoption of International Accounting Standards; and a single passport for recognised stock markets (on the basis of the home country control principle).' (February 2001).

The Lamfalussy process

The Lamfalussy process for securities markets involves four levels:

- Level 1 Community legislation, in the form of Directives or Regulations proposed by the Commission, following consultation with all the interested parties, is adopted under the 'co-decision' procedure by the Council and the European Parliament. Legislation should be based on framework principles, and define implementing powers for the Commission.
- Level 2 Community legislation is adopted by the Commission to lay down the technical details for the framework principles agreed at Level 1 under the 'comitology' procedure:
 - Technical advice is prepared by the Committee of European Securities Regulators (CESR), following a mandate from the Commission and based on consultation with market users.
 - A vote is taken by qualified majority of the Member States represented in the European Securities Committee (ESC).
 - Resolutions are made by the European Parliament: within three months, on the draft implementing measure; and within one month after the vote by the ESC if Level 2 measures go beyond implementing powers.
- Level 3 CESR, which is a committee of national securities regulators, facilitates consistent day-to-day implementation of Community legislation. CESR may issue guidelines and common, but non-binding, standards. It also

equivalent transposition of legislation at Levels 1 and 2 (see the box above).⁽¹⁾

Following a joint initiative by the Chancellor of the Exchequer and the German Minister of Finance in

compares and reviews national regulatory practices.

• Level 4 The Commission, which is responsible for enforcing Community legislation, checks compliance of Member State laws with Community legislation. If necessary, the Commission takes legal action against Member States before the Court of Justice.

Chart 2 shows the new committee structure for financial sector rule-making when all the committees at Levels 2 and 3 have been set up.

- At both Levels 2 and 3, there are to be three separate sectoral committees, for: banking; insurance, including pensions; and securities, including UCITS (ie mutual funds). In addition, a fourth committee at Level 2 will deal with certain specific rules on financial conglomerates, which have operations across different sectors.
- The Level 2 committees may sometimes meet in joint session; and the Level 3 committee chairs and secretariats are also expected to coordinate their activities. The committees can exchange confidential information between them.
- National banking supervisory authorities and non-supervisory central banks are both eligible to attend the Level 3 banking committee. Only supervisory authorities can vote.
- Since 16 April 2003, the acceding countries have had 'active observer status' on all committees, and will in due course have an important role to play and significant voting weight in the Council.

May 2002,⁽²⁾ ECOFIN decided in December 2002 to extend the Lamfalussy process from legislation on securities to legislation on banking, insurance and financial conglomerates as well.⁽³⁾ The first four Directives operating under the new process, at least in

Final Report of the Committee of Wise Men on *The Regulation of European Securities Markets* (February 2001).
 The Chancellor of the Exchequer and the German Finance Minister circulated a letter about regulation in the EU, before the informal meeting of ECOFIN in Oviedo in May 2002. The letter stressed the primacy of finance ministries

in providing democratic accountability and control of any public funds used in rescuing financial institutions.

⁽³⁾ The European Parliament has agreed, though it is seeking powers to call back secondary legislation. This would require an amendment to the Treaty.
Chart 2 Possible new committee architecture for financial sector rule-making



part, are the Market Abuse Directive, the Prospectus Directive, the proposed revision to the Investment Services Directive and the proposed Transparency Directive.

ECOFIN has also set up an EU Financial Services Committee (FSC), which has replaced the Financial Services Policy Group (FSPG). The FSC is chaired by a Member State representative⁽¹⁾ (whereas the FSPG was chaired by the Commission), with a secretariat provided by the Council, and consists of senior finance ministry officials. Its mandate is to provide advice for ECOFIN and the Commission on the oversight of:

- financial integration (ie monitoring progress in implementing the FSAP);
- clearing and settlement;
- corporate governance, in so far as this relates to financial markets; and

 implementation of the recommendations of the Brouwer reports, which involve coordination of, and cooperation among, national regulators on financial stability and crisis management.

Following the Brouwer Reports, a Memorandum of Understanding (MOU) was agreed between all banking supervisors and central banks in the EU to help ensure financial stability. This came into effect from March 2003. The main elements of the MOU are that:

- it consists of a set of principles and procedures for cross-border cooperation between banking supervisors and central banks in the event of a financial crisis with systemic implications affecting more than one Member State;
- these principles and procedures deal specifically with the identification of the authorities responsible for crisis management and the

(1) Dr Kees van Dijkhuizen, Treasurer General of the Netherlands Ministry of Finance.

exchange of information across borders between them; and

• the MOU also provides for the setting up of a logistical infrastructure to support enhanced cross-border cooperation between the authorities.

E What are the implications of the FSAP for EU regulation in future?

The Lamfalussy Committee considered how the Single Market in financial services should be regulated. It proposed that cooperation between national regulators should be strengthened by creating a network of securities regulators through CESR (see the earlier box on the Lamfalussy process on page 359). However, the debate about how the Single Market in financial services should be regulated in future is not yet over. There are differing views:

- The Lamfalussy Committee recommended (in February 2001) that its proposed regulatory structure should be reviewed in 2004, or earlier if sufficient progress was not being made; but that, only if its approach 'did not have any prospect of success', might it be appropriate to consider a Treaty change, including 'the creation of a single EU regulatory authority for financial services generally in the Community'.(1) As the Lamfalussy Committee recommended, the EU institutions have set up an Inter-Institutional Monitoring Group, consisting of representatives of the Council, Commission and the European Parliament, to monitor how the Lamfalussy process is working. The Group's interim report, on the operation of the Lamfalussy process for EU securities legislation, was published in May 2003.⁽²⁾ Its conclusions on the effectiveness of the process to date were largely positive.
- Consistent with the Lamfalussy process, the Wicks Report, published in November 2002 by the Corporation of London,⁽³⁾ recommended a

market-oriented, risk-based approach to regulation, together with better implementation and enforcement of existing EU legislation, transparent consultation, and less use of new legislation in future. It proposed that 'a group of representative market participants' should provide, for the European Council each spring, 'independent, regular reports of progress towards the creation of a fully functioning Single Market'.

• Eurofi 2000 (an association of officials and market participants based in Paris) published a preliminary report in November 2002⁽⁴⁾ arguing that, to build on the Lamfalussy process, 'a European Regulatory and Supervisory System could be established'. This might be based on the model of the European System of Central Banks, and 'would have to be run by a common decision-making process', while the application and enforcement of the resulting rules would be implemented at national level.⁽⁵⁾

F What key issues arising from the FSAP need to be addressed?

A Single Market in financial services has been a long-standing Community objective. Substantial progress has been made towards achieving this, particularly in wholesale financial markets, which are closely integrated already. The achievement of a Single Market in retail financial services is further away. The FSAP is a welcome initiative to close the remaining gap. But it is important that EU regulation addresses the views of market experts (see the box on page 362); that it works with the grain of the market, so as not to stifle financial innovation and risk-taking; and that it creates a level playing field so as to enhance competition among providers of financial services across the EU.

Against this background, what do the UK authorities consider to be the key issues arising from the FSAP that need to be addressed, and where is there common ground on how to address them?

(4) The European Integrated Financial Market: Paris (November 2002).

(5) In a paper on Four Predictions about the Future of EU Securities Regulation (January 2003), Gerard Hertig and Ruben Lee argued that the Lamfalussy process 'will not work, because of its failure to address two fundamental issues: national protectionism and bureaucratic inertia. The resulting failure will make increased harmonisation and some centralisation of supervision inevitable. Notwithstanding current opposition to the establishment of a pan-European securities regulator, there will be a European Securities and Exchange Commission (ESEC). The ESEC will focus initially on corporate disclosure issues, [and] obtain 'soft' enforcement powers.' However, see also a response, *The Unpredictable Future of European Securities Regulation* (April 2003), by Michael McKee, Executive Director, British Bankers' Association.

Final Report of the Committee of Wise Men on *The Regulation of European Securities Markets*: Brussels (February 2001).
 Inter-Institutional Monitoring Group: First Interim Report Monitoring the New Process for Regulating Securities Markets in Europe (The Lamfalussy Process) (May 2003).

⁽³⁾ Creating a Single European Market for Financial Services: a Discussion Paper produced by a working group in the City of London, chaired by Sir Nigel Wicks ('the Wicks Report'), November 2002.

Market experts' views about the FSAP

Financial market experts are widely in favour of completing the Single Market in financial services. But market experts have views about the way in which the FSAP can best be used to help achieve this, and they are particularly aware of problems in retail rather than wholesale financial services.⁽¹⁾

Market consultation

Market experts consider that they need to be properly consulted: first, to help indicate where legislation is necessary, and where alternatives which do not involve legislation, such as encouraging best market practice, may be at least as effective; and second, where legislation is necessary, to improve it. However, proper market consultation (eg by CESR) requires a genuine dialogue, which takes time, and should not be rushed. And when consultation takes place, the Commission and other authorities need to take full account of the message they receive from the market, while market participants need to respect the consultation process by accepting the majority view. If this is done, new measures will be more robust: that should be more efficient from the market's point of view and save legislative time in the longer run. Consultation of consumer groups (eg through the FSA in the United Kingdom) also helps to improve new legislative measures.

Negotiation of new measures

Many market experts consider that, while a great deal of progress has been made in designing and implementing new measures under the FSAP, the negotiation of new FSAP measures does not always meet the objectives originally set, for a number of reasons:

- Approach to financial integration Member States have advocated different approaches to achieving financial integration in the EU. Some Member States have focused on harmonising a minimum set of core principles, and ensuring market access through mutual recognition, so that a market firm authorised to provide services in its 'home' country has a 'passport' to provide them in all other EU countries. But other Member States regard harmonisation of core principles as insufficient, and advocate uniform standards, under which consistent and detailed rules would apply throughout the EU.
- *Restrictions on competition* In the negotiation of new Directives, the Commission sometimes

faces resistance to the removal of barriers by Member States concerned to maintain existing restrictive practices. For example, clauses in Directives concerning the 'general good' and consumer protection have been used by Member States to retain national rules which create barriers to foreign competition, whether through a local branch or cross-border.⁽²⁾

• *Retail financial services* More progress has so far been made in integrating wholesale financial markets across the EU than retail markets. It is not clear that regulatory harmonisation alone will be sufficient to complete the Single Market in retail financial services, as tax, legal and cultural barriers remain.⁽³⁾

Implementation and enforcement

There appears to be a growing consensus among market experts that, once the original FSAP measures have been adopted, the Commission and regulators (eg in CESR) should focus to a greater extent on the timely and accurate implementation and enforcement of existing legislation rather than on the introduction of more new legislation.

Flexibility and speed of adaptation

Many market experts consider that the regulation of professional investors in wholesale financial markets needs more flexibility than the regulation required for retail markets. This is difficult to achieve in some Member States, as national legislation is too detailed to allow the degree of discretion that is common in, for example, the UK regulatory system (eg in distinguishing between professional and retail investors, or allowing 'prudent man' discretion in pension fund asset allocation). There is also a risk that, if EU legislation relating to retail markets is not well drafted, it will have adverse consequences for the operation of wholesale financial markets.

Costs and benefits for market participants

Many market experts consider that the Commission should analyse in more detail the cost-effectiveness of proposed new FSAP measures, and the interaction between them. Their impact needs to be considered, not just on market behaviour and the efficiency of financial markets within the EU, but also on the EU's global competitiveness, and in particular in relation to the United States.

⁽¹⁾ See, for example, the Wicks Report (November 2002).

 ⁽²⁾ See also: Friedrich Heinemann (ZEW)/Investment Management Association, Towards a Single European Market in Asset Management (April 2003).
 (3) See also: Association of British Insurers, Retail Financial Markets in the EU: a Critical Survey (February 2003).

⁽³⁾ See also. Association of Diffish histories, keitan rinancial Markets in the EU: a Critical Survey (redruary 2003).

- First, proper market consultation remains important: to help indicate where legislation is necessary, and where alternatives which do not involve legislation, such as encouraging best market practice, may be at least as effective; and, where legislation is necessary, to improve it. However, market consultation requires a genuine dialogue, which takes time, and should not be rushed. It is more important that proposals should be well designed than that they should be quickly adopted, even if this means that the target date of the end of 2005 for the completion of FSAP measures is not achieved in every case.
- Second, new FSAP measures should be based on mutual recognition, with common core standards, especially in wholesale markets. There is room for debate about the degree of 'singleness' required to complete the Single Market in financial services, but no clear or simple answer.⁽¹⁾ New EU legislation may not be the best way of removing barriers that are peculiar to one Member State and are not common across the EU as a whole.
- Third, more emphasis should be given to ensuring that FSAP measures are implemented consistently and promptly at national level and properly enforced. This is the responsibility of the Commission, the Lamfalussy committees and Member States themselves. But market participants, trade associations and consumer groups also have a role to play in bringing complaints to the attention of the relevant authorities.
- Fourth, the Commission needs to attempt an objective analysis of the cost-effectiveness of FSAP measures, the interaction between them and their impact on market behaviour. The Commission's proposals for indicators of efficiency and integration may help to achieve this.
- Fifth, greater recognition is needed that financial markets today are global. The consequences of EU action on the competitive position of EU-based firms and markets need to be considered. Equally, greater efforts are required to seek solutions to regulatory issues at a global level through, for example, mutual recognition agreements, strengthened dialogue and information exchange.

- Sixth, the EU and national competition authorities have a vital role in investigating barriers to competition in financial services across the EU, and instituting remedial action. Besides competition internally across the Single Market, competition is also important externally (eg *vis-à-vis* the United States).
- Seventh, national regulators need to be able to use their discretion in adapting quickly and flexibly to market developments. This is especially the case in wholesale markets.
- Finally, the priority should be to make the Lamfalussy process work well by reinforcing the cooperation that already exists between the network of national regulators, rather than to create a central system of European regulation—for which the specification remains in any case very unclear and which would require a change in the Treaty. The EU network of national securities markets regulators (CESR)—and the equivalent Level 3 banking and insurance committees—have a major task ahead, and need the resources to match.

G How does the United Kingdom make a contribution to the FSAP?

HM Treasury, the FSA and the Bank play key roles in identifying, influencing, promoting and overseeing the United Kingdom's interests in financial services in the EU.

- HM Treasury is responsible for the United Kingdom's strategy towards financial services legislation in the EU. The Chancellor represents the United Kingdom at ECOFIN, and Treasury Ministers are directly accountable to Parliament. HM Treasury is responsible for UK policy at Level 1 and Level 2 of the Lamfalussy process.
- The FSA has responsibility in the United Kingdom for the authorisation and supervision of financial services institutions and markets and, within the agreed legislative framework, for regulatory policy. The FSA contributes at Level 2 of the Lamfalussy process through the provision of technical advice on implementing measures, and is responsible in the

⁽¹⁾ See, for example, David Green, Head of International Policy, FSA: 'We are convinced that mutual recognition based on harmonised core standards is the best way to go. The trick, of course, is to identify just which standards need to be harmonised, and which can be left to local discretion without damaging the integrity of a single financial market.': *Philosophical debate or practical wisdom? Competing visions of the EU's financial services sector*. FAZ Conference (March 2003).

United Kingdom at Level 3 through the Regulators' Committees.

• The Bank is responsible for the overall stability of the UK financial system and has a role in promoting the effectiveness of UK financial services. It will contribute to the Lamfalussy process, and provides a window on the ECB's impact on the functioning of the EU financial sector, especially in the operational payments and settlement areas.

HM Treasury and the FSA, with support from the Bank, consult market participants on FSAP measures. Market associations also play a key role in ensuring that market participants' views are fully represented at EU level in Brussels. The UK consultation process includes:

- regular Ministerial breakfasts for chief executives and financial leaders to raise awareness of EU financial services issues at a high level;
- high-level public-private sector discussions, jointly chaired by HM Treasury and the FSA, to consider EU financial services strategy;
- regular EU stocktake meetings at HM Treasury for trade associations, organised markets and consumer groups, to provide information and obtain feedback;
- quarterly international roundtables at the FSA with HM Treasury, trade associations, consumer groups and other relevant bodies, to provide information and discuss EU and global financial services issues;
- roundtables, and small drafting groups, at HM Treasury on specific Directives, so as to consult the market on the Government's negotiating stance in Brussels; and
- consultation documents on implementing FSAP measures by HM Treasury or the FSA, as appropriate.

The FSA also has two statutory objectives relating to consumers, under the Financial Services and Markets Act 2000. The first is to promote public understanding of the financial system. The second is to ensure an appropriate degree of protection for consumers. These objectives inform the FSA's approach to financial services issues in the EU as well as domestically.

Further information

A common theme running through this paper is the importance of consulting market participants on the FSAP. Consulting the market is particularly important in the United Kingdom, because of the City of London's role as an international financial centre, and the contribution it already makes to the Single Market in financial services. However, for consultation to be effective, market participants need to be aware of new initiatives under the FSAP, and ready and able to respond in a considered and timely way. Useful sources of further information about the FSAP are included below:

- The European Commission publishes six monthly reports on *Progress on the Financial Services Action Plan*, which are available, along with a wide range of other material about the FSAP, at http://europa.eu.int/comm/internal_market/en/finances/actionplan/index.htm
- A full list of FSAP measures, including the state of play on those not yet completed, is provided at http://europa.eu.int/comm/internal_market/en/finances/actionplan/annex.pdf
- Details of individual directives by subject (eg banks, insurance, securities etc) are provided at http://europa.eu.int/comm/internal_market/en/ finances
- The Inter-Institutional Monitoring Group for securities markets has a website at http://europa.eu.int/comm/internal_market/en/ finances/mobil/lamfalussy-comments_en.htm
- The Economic and Monetary Affairs Committee of the European Parliament carries relevant material on its website at http://www.europarl.eu.int/ committees/econ_home.htm
- HM Treasury publishes summaries of the key issues on individual FSAP measures, and links to texts. Its website is at http://www.hm-treasury.gov.uk/
- The Financial Services Authority (FSA) publishes consultation papers on FSAP measures and discussion papers on other relevant EU issues on its website at http://www.fsa.gov.uk/pubs/ index-type.html

- The Committee of European Securities Regulators (CESR) publishes mandates from the Commission, and other material on securities markets directives under the Lamfalussy process, on its website at www.europefesco.org
- The Federation of European Securities Exchanges (FESE) website contains position papers and submissions in response to consultations on FSAP directives at www.fese.be/initiatives/european_ representation/index.htm
- The British Bankers' Association (BBA) produces a regular EU newsletter for members. Its website includes BBA and European Banking Federation (EBF) submissions in response to consultations on directives at www.bba.org.uk/public/corporate/ #35473 The EBF website is at http://www.fbe.be/

- The Association of British Insurers (ABI) website includes a short section on EU regulation under 'current issues/Europe', with contact details at the ABI, at www.abi.org.uk
- The London Investment Banking Association (LIBA) website provides, for members, a market commentary on some EU directives, and includes a section on 'EU issues (also see electronic commerce, accounting and taxation)', at www.liba.org.uk
- The Investment Management Association (IMA) website includes a section on 'publications/ responses to consultations', including a European section at http://www.investmentfunds.org.uk/ Publications/default.htm

Credit conditions and monetary policy

In this speech,⁽¹⁾ Paul Tucker, executive director of the Bank of England and member of the Monetary Policy Committee, discusses the interactions between the financial and real economy and their impact on monetary policy. In particular, he addresses the household and corporate sectors in the United States and the United Kingdom, emphasising the importance of credit conditions as an input to monetary policy. A key question for the current outlook for the global economy is whether US business investment will recover before US household consumption decelerates. In the United Kingdom, households have taken advantage of changes in the availability of finance, which, together with the low interest rate environment and rising house prices, have contributed to an increase in borrowing. Higher borrowing does mean that households are more vulnerable to economic shocks; finances would prudently be managed on the basis that rates are likely to be somewhat higher on average in the medium term. Policy is currently rightly supporting demand growth in order to keep inflation on track to meet the 2.5% target.

Many thanks to the Leeds Financial Services Initiative for the opportunity to speak to you today. Many thanks also to Mark Pratt, the Bank of England's Agent for Yorkshire and the Humber, for helping to arrange today's event. Perhaps I can take this opportunity to pay tribute to the work of the Bank's Agents around the country, whose contributions to UK monetary policy I have certainly come to appreciate in the year or so I have been on the Monetary Policy Committee. The Agents play a vital role in ensuring that the Committee does not drift away from the real-world experience of businesses operating in the economy. We are really very grateful for all the help that you and other contacts around the country give to Mark and his colleagues.

Your group—comprising local bankers, brokers, fund managers and advisors—is especially appropriate for exploring my view of one particular dimension of the challenges currently confronting monetary policy here and abroad: the interactions between the financial economy and the real economy.⁽²⁾ Those challenges are not immediately apparent from most headline economic forecasts, or indeed from the Monetary Policy Committee's own central projections. Broadly, our August *Inflation Report* has the UK economy operating at pretty close to potential over the next few years, and inflation close to the $2^{1}/_{2}$ % target. And just below those main headlines, we have growth in both the United States and the euro area recovering strongly—to trend, in fact—so that, from a UK perspective, net trade moves from subtracting from output growth to broadly neutral. That, along with some recovery in business investment and sustained robustness in government spending, helps to fill a gap prospectively left by a projected slowdown in consumer spending growth—leaving, as I said, aggregate demand broadly in line with supply.

That apparently benign story belies some complex risks not too far beneath the surface. Assessing many of them calls for an examination of financial market/real economy interactions, especially in the United States and the United Kingdom. Since that is where a central bank's monetary policy and financial stability missions meet, it should be familiar territory. In fact, the route by which we got here has been anything but familiar.

To recap: since the Summer of 1996, net trade has persistently reduced output growth. Quite apart from the effects of the pound's 25% appreciation in the mid-1990s, over the past three years or so this has also been down to a series of adverse shocks to world economic growth. Faced with that, UK interest rates have been progressively reduced—from 6% in February 2001 to 3.5% now—to support domestic

Given to the Leeds Financial Services Initiative on Thursday 28 August. This speech can be found on the Bank's web site at www.bankofengland.co.uk/speeches/speech201.pdf.

⁽²⁾ With many thanks to Fergal Shortall and Peter Andrews; to Colin Miles, Alex Bowen and David Rule for continuous discussions over recent years on financial conditions and risk; and to Michelle Morris and Jane Jones for secretarial support.

demand growth. Since 1996, annual consumption growth has averaged over 4%—well above trend. And it has remained stronger than expected, as underlined by last Friday's data for Q2, which estimated quarter-on-quarter consumption growth at 1.3%. This has, of course, been accompanied by rapidly rising debt. Stimulating demand has worked nicely in terms of keeping inflation broadly in line with the $2^{1}/_{2}$ % target. The question has been whether there are limits to a strategy of a small, open economy seeking to offset adverse developments from overseas that are well beyond its control.

Answering that question in the abstract is straightforward: yes. Of course there is a limit: for example, it would make no sense to induce households or firms in aggregate to accumulate debt beyond their means. The subsequent balance sheet 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. Rather than elaborate on that todayexcept to say that the possibility of complicating the future operation of policy should be weighed—I want instead to trace through just a few of the practical challenges in assessing those risks. In doing so, I want to stay faithful to the interests of this audience. So I will focus on household and corporate balance sheets in the United States and the United Kingdom, and on the financial conditions they face.

Financial conditions in the United States

There can be no apology for spending time on the US economy. It has been centre stage, and remains so. Of course, the euro area accounts for a greater share of UK trade. But with domestic demand there—especially in the three largest continental economies—anaemic, which is a subject for another day, global prospects and financial market confidence continue to depend disproportionately on the United States.

But the United States continues to work through the legacy of the late 1990s. Buoyed by evidence of a fairly remarkable improvement in measured productivity growth, based at least in part on efficiency gains from the new technologies, investment and equity prices boomed from the mid-1990s. Many of the ill-fated dot.com ventures were equity financed. But across the economy as a whole, equity was retired (net), and much of the investment boom was in fact financed by debt (see Chart 1): telecom is just the most infamous example. Capital gearing (valuing assets at replacement cost) and income gearing rose.

Chart 1

Sources of corporate finance(a)



(a) Data are annual.

(b) Loans, bonds and commercial paper.

(c) Capital expenditure less the sum of US sourced internal funds and inventory valuation adjustment.

Household borrowing accelerated too. At one level, this all made sense. On a benign view, companies and households, taken in aggregate, were simply borrowing against the higher future incomes that higher trend productivity growth appeared to promise. With overall national saving below investment, the external counterpart was a growing US current account deficit. But with demand for US assets supported by a belief in high prospective returns, the dollar rose. That broadly was the story until the party ended in the early months of 2000.

US corporate sector adjustment

From their high point in March 2000 to a low point roughly three years later, world equity markets fell by almost 50%. For US businesses, the subsequent slowdown in demand had two direct implications. They were carrying excess capacity, and too much debt. But the indirect effects were as potent. The darker underside of the boom years began to become apparent in a series of corporate scandals, denting confidence in published accounts and business ethics generally. While the number of business bankruptcies had up to that point only ticked up slightly, the value of defaults reached record levels following the scandals (see Chart 2). Some banks announced large credit losses. Borrowing conditions deteriorated. According to the Federal Reserve's quarterly Senior Loan Officer Survey,



(a) Chapter 11 filings as a percentage of total assets of non-financial companies at historical cost.

(b) Total business filings as a percentage of total number of companies.

bankers had already been tightening lending conditions—in some cases following recognition that loan underwriting standards, especially for leveraged loans, had been overly relaxed in 1997/98. Debt market investors now started to focus on corporate liquidity risk, concluding that there was overreliance on short-term debt. For a while, there was a generalised retreat from risk.

This heady cocktail could be seen in market indicators of corporate credit risk: the spread of corporate bond yields over risk-free bond yields rose, for all ratings. By the Autumn of 2002, the atmosphere in credit markets was febrile, with anxiety briefly even affecting some well-capitalised financial sector firms.

Against this background, it is perhaps not surprising that corporate boardrooms—throughout the industrialised world, but perhaps especially in the United States—focused on two main objectives: better governance and strengthening their balance sheets.

The latter is easier to measure. Although pressures remain in some sectors, US balance sheets have been strengthened somewhat. Commercial and industrial companies have for a while been repaying bank loans. And there has been a significant extension of debt maturities, reducing any incipient liquidity risks,

(1) See Bank of England Financial Stability Review, June 2003, pages 11 and 15-17.

Chart 3 Capital and income gearing of non-financial corporate sector



Sources: Board of Governors of the Federal Reserve System: 'Flow of funds accounts of the United States', 2003 Q1 and Bureau of Economic Analysis, Department of Commerce.

although there has not been much change in total debt relative to equity (at replacement cost) (see Chart 3). Debt-servicing obligations are down relative to operating profits, although that is probably unremarkable given the sharp reductions in dollar interest rates. One concrete diagnostic of the market's view is the substantial fall in credit spreads since last autumn. No doubt that partly reflects some unwinding of an overshoot then, and some market participants believe that this year spreads have overshot on the downside, reflecting a so-called 'search for yield' in an environment of low nominal returns from government bonds and uncertainty about future equity returns.⁽¹⁾ But it is striking that credit spreads have not risen with the recent sharp increase in government bond yields. And the most recent Senior Loan Officer Survey suggested that fewer domestic banks were tightening credit conditions. So I am inclined to take a degree of encouragement that market perceptions of credit risk have improved somewhat this year.

Gauging the temperature in corporate boardrooms about governance is more difficult; it is probably not even the kind of thing that our statistical models can track. Although only indirect evidence, some mild encouragement can probably be taken from stirrings in the mergers and acquisitions (M&A) market in the United States, although M&A do not equate to capital expenditure. And I would guess that the recovery in equity markets since March will help to buttress boardroom confidence. More concrete was the reported rise in business investment in Q1 and the improvement in business surveys. But we will need to see more hard evidence of an investment recovery in the official data before concluding that the corporate sector's problems are behind us.

US household sector financial conditions

The key question, of course, is whether business investment will stage that recovery before US household consumption decelerates. The most tangible threat to household spending has come from adjustment by the corporate sector itself: cost cutting. Over $2^{1/2}$ million jobs have been lost since February 2001, and unemployment has risen from 3.9% to 6.2% on the latest reading. Perhaps ironically, given the unusual strength of productivity growth during the economic slowdown, businesses have not needed to add to the workforce in order to meet growth in demand. Consumer confidence surveys suggest that there is anxiety about job prospects. But so far at least, this does not seem to have had much effect on aggregate consumer spending, although there must surely be a downside risk looking ahead if labour market conditions continue to deteriorate.

What explains the robustness in consumption, bearing in mind that, reflecting lower equity prices, US household financial wealth is 25% lower than three years ago? Most obviously, the substantial easing in monetary policy. That has probably supported housing market conditions. House prices have risen by around 7% per year on average over the past three years, and mortgage equity withdrawal has risen sharply (see Chart 4). Households have also been refinancing their mortgages

Chart 4 Mortgage equity withdrawal by the US household sector^(a)



Source: Board of Governors of the Federal Reserve System: 'Flow of funds accounts of the United States', 2003 Q1.

on a record scale. This has been made possible by the distinctive features of the US mortgage market: namely, the prevalence of long-maturity fixed-rate mortgages with a prepayment option that enables households, for relatively small transactions costs, to lock into lower debt-servicing costs as long-term mortgage rates fall.

Bond yields reached a low in June, having fallen pretty well steadily for over three years. Most of that decline was simply a reflection of cuts in official interest rates as the economy slowed, coupled with a growing market expectation that they would remain low for a prolonged period. It is not obvious, however, that expectations of the path of short-maturity rates can explain the sharp drop in medium to long-term yields around the middle of this year. But as a borrower, you don't much care why your mortgage rate has fallen, and so many American households were able to refinance at record low mortgage rates.

Recently, US mortgage rates have risen by about 1 percentage point. On some estimates, that has reduced the proportion of mortgages that can profitably be refinanced from around 90% in June to under 20% now. Of course, if bond yields stay where they are or even if they were to rise further, probably millions of US households will have locked in exceptionally low financing costs. Other things being equal, that will have strengthened their cash flows and balance sheets, against a background of record debt-to-income levels; debt to net worth having shot up following the fall in equity prices; and a historically high debt-servicing burden. Such balance sheet strengthening would tend to support the economy going forward. To the extent, though, that households took out more debt when refinancing their old debt, their balance sheets may not have been strengthened. We will not know until we see the Federal Reserve's Q2 Flow of Funds data in September. What we can be more confident of is that, given the substantial recent rise in bond yields, the US economy is now less likely to enjoy extra injections of demand from mortgage refinancing. Cumulative rises in house prices across the nation will, though, probably provide scope for continuing mortgage equity withdrawal going forward.

The US fixed-rate mortgage market

Given the important role that mortgage financing has played in this US cycle, and the debate in this country about fixed-rate mortgages, it is worth pausing at this point to pick out two consequences of the distinctive

⁽a) Four-quarter moving average of secured lending to the household sector less housing investment.

structure of the US market: the volatility and complexity of dollar interest rate markets, and the path dependency of part of the monetary transmission mechanism.

First, US bond yields are more volatile than bond yields in other industrialised countries (see Chart 5), because of the US financial sector's need to manage its interest rate exposures.⁽¹⁾ The right to repay early enjoyed by US mortgage borrowers is a financial option, ie a derivative. The option writers-largely owners of mortgage-backed securities (MBS)-need to hedge their exposure to the probability of exercise of the option, the value of which changes as market yields move closer to or away from the interest rate charged on the underlying mortgages. The US household sector is on one side of this option—in the jargon, households are 'long'; and the US financial sector is on the other side, or 'structurally short'. But the household sector does not otherwise participate materially in the interest rate options market, so financial firms are left to sort out their risk management problem without a complete hedge being available for the sector as a whole. Precisely what they need to do depends on the interest rate structure of their liabilities relative to that of their assets. And that is affected by a peculiar property that the prepayment option gives to US mortgage-backed bonds.

Chart 5

Three-month historical volatility of ten-year government bond yields



For normal bonds, when yields fall, their price rises; and the greater the rate at which yields fall, the greater the rate of increase in the bond's price. It is the opposite for US mortgage-backed securities (at least across a certain yield range, where the prepayment option is 'close to the money'). This is referred to as having negative convexity.⁽²⁾ Indeed for some mortgage products, the price of the security falls as yields fall! In the absence of a complete hedge for the financial sector, mortgage investors are left having to hedge the risks arising from option prepayment dynamically, which means that they continuously adjust other elements of their bond and derivatives portfolios as yields fluctuate. In very broad terms, this involves the following. As bond yields fall, a faster pace of mortgage prepayment typically reduces the average maturity of the expected cash flows from mortgage assets relative to a firm's liabilities, prompting them to buy medium to long-maturity fixed-rate securities in order to rebalance their asset/liability mismatch. When the amounts concerned are very large, as they can be since the US mortgage market is very large and mortgage investors have similar positions, these bond purchases can push yields down still further, reducing mortgage rates and triggering more prepayments etc. So convexity hedging tends to reinforce, or exaggerate, falls in bond yields. The same applies in reverse.

Most commentators agree we saw precisely that recently when dollar bond yields ticked up. The initial trigger was probably an improved perception of the US economic outlook accompanied by changed expectations of the path of FOMC rates and possibly reduced expectations of 'unconventional' monetary policy in the future (ie of the Fed buying long-maturity bonds to increase the supply of base money). But the violence of the move was down to so-called mortgage convexity hedging. (An independent diagnostic is provided by a very sharp widening in swap spreadsbroadly, the spread between the fixed rate at which banks borrow and the rate at which the US government borrows. That is because a lot of the hedging was effected via the swaps market; as MBS-holders found themselves with more medium to long-maturity fixed-rate assets than expected, they will have entered into swaps transactions to pay fixed and receive floatingrate streams of cash.) This is a pretty sophisticated business, which complicates risk management in dollar interest rate markets, as the Bank has for some time discussed in various Financial Stability Reviews.(3)

A second implication of the structure of the US mortgage market concerns the way in which monetary

⁽¹⁾ See Bank of England Financial Stability Review, June 2002, pages 36-37 and 70-72.

⁽²⁾ For an explanation of convexity, see Bank of England Financial Stability Review, June 2002, page 72.

⁽³⁾ See, for example, page 16 of the June 2003 issue.

policy is transmitted. Crucially, it makes the transmission mechanism path dependent. By that, I mean that for any small change in medium to long-term yields brought about by, say, changed perceptions of the path of monetary policy, the impact on consumption will depend on where the level of current mortgage rates is relative to the distribution of historical mortgage rates being paid by existing borrowers. So, for example, once US mortgage yields had reached near record low levels during 2002, any further falls were likely to bring forth a lot of refinancing. In fact, mortgage rates fell to progressively lower record levels, and it seems that some households did indeed refinance twice or more as borrowing costs fell. But US mortgages are long-maturity loans, so if yields were to back up a long way, small falls thereafter would have little or no effect on the probability of the existing stock of mortgages being refinanced, making incremental small falls in yields a less potent part of the monetary transmission mechanism.

Neither of these features of the US mortgage market is inherently good or bad,⁽¹⁾ but they are the kind of thing that I am sure will be considered in depth in the review of the structure of the UK mortgage market commissioned by the Government to Professor David Miles.

UK financial conditions

Changes in the supply of credit to households

Although the structure of the UK market is different, there have been important changes in the availability of finance to households. Most obviously, the fixed-rate mortgage market has grown, especially for two and three-year mortgages. Over 50% of new mortgage borrowing this year has been at fixed rates. Reflecting changes in money market rates, the cost of such mortgages fell in the early months of the year, but has risen more recently. Other things being equal, I view that as a loosening followed by a tightening of credit conditions, which I took into account in my votes in February and July/August. Given that this market is still relatively new, I am not sure that our econometric models fully capture its influence on household finances and spending. We may be able to revisit that as a longer time series becomes available.

If access to fixed-rate mortgage finance has increased, that probably owes something to the more stable macroeconomic environment and to increased liquidity in the swap market. These developments reduce the risks to banks of carrying fixed-rate assets on their balance sheets and increase their ability to hedge any consequent interest rate risk in the money markets.

Greater stability in the economy, and in particular the much reduced risk of lurching from boom to bust, has probably also helped to foster increased competition in consumer credit markets by reducing fears of exaggerated cyclical rises in defaults. The spread on the interest rates charged on credit cards and personal loans over 'base' rate has been drifting down since the mid-1990s (see Chart 6). In the mortgage market, it has become easier to negotiate new terms and cheaper to unlock housing equity. That may help to explain the rise in the share of gross mortgage advances accounted for by remortgaging; from around 20% a few years ago to nearly 50% now.

Chart 6 Interest rates for unsecured credit



UK household sector balance sheet

Those more or less structural changes in the supply of credit have been occurring during a period in which borrowers and lenders have also been adjusting to a low

⁽¹⁾ This account has abstracted from who are the main investors in MBS, which is another distinctive feature of the US market. Part of the impetus for securitisation comes from mortgage originators not wanting, or being able, to manage the embedded interest rate risk. Unlike in the United Kingdom, mortgage origination, servicing (collecting the interest and principal repayments) and investment are unbundled. Securitisation is facilitated by—although it is not clear to what extent it depends on—mortgage credit risk being homogenised via guarantees from so-called government-sponsored agencies. The largest such agencies (Fannie Mae and Freddie Mac) are not guaranteed by the Federal Government, although the credit markets perhaps behave as if they were. They are amongst the largest holders of the MBS that they guarantee.

inflation/low nominal interest rate environment, and during which official interest rates have been cyclically low. The upshot has been lots of borrowing. Some commentators have tended to focus on the degree to which the household sector has been in financial deficit, ie the extent to which investment in housing has exceeded savings out of income or, equivalently, to which the accumulation of debt has exceeded the acquisition of financial assets. But this measure of household financial flows cannot provide an adequate basis for assessing risk, which depends on the household sector's overall balance sheet—a stock concept. Where the flow data can help is in tracking the extent to which households are adjusting, eg whether or not the sector is moving back towards surplus to strengthen its balance sheet.

One way of thinking about the household sector's balance sheet is to draw on a framework used to assess the risk of company default;⁽¹⁾ it is no more than an analogy, since households may be more credit constrained than companies and the analysis of a sector is different from the analysis of an individual borrower, but I think it is potentially illuminating. For a company, the risk of default depends, in broad terms, on three variables: the value of its assets, ie the net present value of its future income streams minus its costs; the variability of its asset value; and the amount of debt it carries. In the current context, the key point is that the greater the volatility of a firm's asset value, the more likely it is to default for any given level of debt. So, conversely, the risk of default is reduced if the volatility of the value of the borrower's assets is reduced. Something broadly analogous to that may have happened to the UK household sector taken as a whole.

The improved policy regime progressively put in place since the early 1990s is designed to deliver greater macroeconomic stability. During the 1970s and 1980s, inflation was not only higher on average, it was also considerably more variable. In consequence, nominal interest rates were highly variable. But not only that. Real interest rates were also more variable than now, as the economy swung from boom to bust. A benefit of the current regime should be that households are less likely to have their balance sheets torpedoed by rocketing official interest rates as the authorities belatedly struggle to correct past policy mistakes. In parallel, changes in the real economy seem to have brought about a gradual reduction in the sustainable level of unemployment. That, taken together with a more efficient labour market more generally and a lower risk of boom/bust, may have helped to improve job security. If household finances and, in particular, their cash flows—have become less volatile for these or other reasons, then households can probably prudently carry more debt than in the past.

Stepping away from that framework, households' capacity to carry debt will also have increased to the extent that they can substitute from expensive unsecured debt to cheaper—because, for the lender, less risky—secured debt, on account of the rise in house prices and increased availability of secured lending products.⁽²⁾ Given the continued robustness of unsecured borrowing, it is difficult to know whether such 'debt consolidation' is material; anecdotally it is.

No doubt reflecting each of these factors in varying degrees and also simply that houses cost more today, households have increased their debt. The sector's debt-to-income ratio has risen 25 percentage points over five years, to record levels. The difficulty is knowing how much is safe, or how much is too much. Nobody is going to be able to answer that with confidence for the sector as a whole, and it would be dishonest to pretend that I can.

There are two quite different ways into the question. One is to ask whether the household sector might exceed its budget constraint, ie borrow more than it will be able to repay from its expected future incomes. Some commentators suggest that this is *prima facie* unlikely since households would have to be 'irrational' in order to find themselves in that position. Although I do not think that is terribly likely on an aggregate scale, I would not completely rule out that scenario, as complete sectors can find themselves forming mistaken expectations about the future. The developments I described earlier in the US corporate sector in the mid to late-1990s may provide an example; large US corporates are hardly unsophisticated. Another is the

⁽¹⁾ See Merton, R C (1974), 'The pricing of corporate debt', *Journal of Finance*, Vol. 29, No. 2, May, pages 449–70; and Tudela, M and Young, G, 'Predicting default among UK companies;' a Merton approach', *Bank of England Financial Stability Review*, June 2003, pages 104–13.

⁽²⁾ See Aoki, K, Proudman, J and Vlieghe, G (2002), 'House prices, consumption and monetary policy: a financial accelerator approach', Bank of England Working Paper no. 169, for a more formal treatment. The key reference in this area, for the corporate sector, is Bernanke, B, Gertler, M and Gilchrist, S (1999), 'The financial accelerator in a quantitative business cycle framework', in Taylor, J and Woodford, M (eds), The handbook of macroeconomics, Vol. 1, North Holland, Amsterdam.

UK household boom in the late-1980s: while aided and abetted by policy mistakes, borrowers and lenders were not forced to behave as they did. The current risk rather less dramatic than those two examples—is that households, and conceivably lenders, extrapolate forward two features of the past few years. The first would be to assume that real personal disposable incomes will continue to grow as rapidly (see Chart 7).





It is unlikely that they will. Recent years were unusual as household spending power was buttressed by a fall in the price of imported consumer goods and services relative to our exports. And going forward, disposable income growth will be reduced by the increase in National Insurance contributions and, most likely, by employment growing less rapidly than over the past decade. The second risk is that it will not be appreciated that the current low level of debt-servicing costs, and possibly also the record low level of mortgage arrears (see Chart 8), owes something to official interest rates needing to be set below their likely long-term average level in order to support the economy. I do not think we have the data to assess those various risks quantitatively. Probably the best we can do is to talk about them. Ultimately it depends on individual households, and their lenders, reaching their own view in the light of their particular circumstances.

Even if households are not affected by either of those possible misperceptions, more debt unavoidably leaves them more vulnerable to bad luck, eg adverse economic shocks. Returning to my analogy with firms, this is saying no more than that a highly geared borrower is exposed to more risk than a borrower with low gearing. Bankers emphasise that significant household sector defaults have in the past occurred only in the face of a

Chart 8 UK-resident financial institutions' arrears on UK mortgage lending^(a)



(a) UK-resident financial institutions are those banks, building societies and other lenders who are members of the CML and who, together, undertake around 98% of all residential mortgage lending in the United Kingdom.

rise in unemployment and a rise in interest rates. And, of course, in the past the monetary authorities managed to produce precisely that potent combination by allowing inflation to get out of control to the point where a sharp rise in interest rates was required, effectively pushing the economy into recession, with a consequent loss of jobs. That seems considerably less likely today. Even though we have had very rapid house price inflation, that has not been accompanied by rising consumer price inflation, which on the contrary has stayed close to the $2^{1}/_{2}$ % target.

For me, one worry has rather been that the economy would suffer a supply shock—say a large rise in oil prices—that was expected to persist and had the effect of dislodging medium-term inflation expectations away from the $2^{1}/_{2}$ % target. In those circumstances, the MPC might not be able to reduce interest rates to offset the demand effects of the shock, and might conceivably even have to raise them. It was therefore a relief that the risk to oil markets from the Iraqi war passed without that kind of event, which I believe remains a low probability. (I shall return to the vital importance of inflation expectations in concluding.)

If increased debt entails increased risk for households, a key question is whether they—rather than the monetary authority—have the wherewithal to manage it. Setting aside their ability to cut back on spending/increase saving, that depends on whether they can draw on a pool of liquid assets and on whether they have surplus collateral that they could pledge to lenders in the face of adverse developments. The sector's liquidity position is, frankly, ambiguous. On the one hand, taken as a whole, households' liquid assets appear to be high relative to income and relative to scheduled debt-servicing payments (see Chart 9). On the other hand, liabilities have been growing rapidly relative to liquid assets (see Chart 10). Those aggregate data do, of course, mask considerable variation across households. Analysis of what little disaggregated data we have suggests that more-heavily indebted households do not carry more liquid assets than the less indebted, although the latest data are now three years old.⁽¹⁾

Chart 9

Household M4 liquidity measures^(a)



Sources: Bank of England and ONS.

- (a) Liquid assets are defined as household M4 holdings.
- (b) Liquid assets divided by quarterly interest payments and regular mortgage principal repayments.
- (c) Liquid assets divided by household disposable income.

Chart 10





By contrast, subject to one important proviso, the collateral position is clear. The sector has a lot of 'equity' in housing against which it has not borrowed (see Chart 11). And even for new mortgage business, loan-to-value ratios do not seem to have increased as they did in the late 1980s. So there appears to be a cushion that, relative to past cycles, may well increase the capacity of households to smooth their consumption.

Chart 11





The proviso, of course, is whether or not house prices will hold. I do not want to get into that today, other than to make three observations. First, the current regional variation in house price inflation is quite striking, with the market still apparently robust in parts of the North of England, Scotland and Wales (see Chart 12). In previous cycles—and notably so in the late 1980s—house prices in London and the South East rose strongly before prices elsewhere. Prices outside the South East belatedly shot up, only to be squashed as

Chart 12 Quarterly regional house price inflation in 2002 Q2



(1) See Cox, P, Whitley, J and Brierley, P (2002), 'Financial pressures in the UK household sector: evidence from the British

Household Panel Survey', Bank of England Quarterly Bulletin, Winter, pages 410-19.

official interest rates were ratcheted up to slow down the economy and restrain general price inflation. This time round the possible process of 'catch up' outside London is not being dampened by moves to a contractionary monetary policy. This is another novel feature of the current cycle—the first we have been through since the 1997 change in the monetary regime.

Second, although it has been coming out slightly stronger than assumed in the MPC's central projections, house price inflation in the country as a whole has slowed down since last year. It is too early to conclude that it is reaccelerating or that adjustment is not taking place. Third, there seems to be less immediate risk of severe weakness in house prices. The surveys of the Royal Institution of Chartered Surveyors have not proved terribly good predictors of house price inflation, but they do plausibly give a reading on the mood in the country about downside risks. The balance of estate agents expecting prices to rise has moved from -47 in March to +14 on the most recent reading (July).

Earlier in the year, my own view was that, relative to our then central projections, the balance of risks to house prices was on the downside; but that if those risks receded, the balance of risks to consumption was on the upside on account of the greater capacity of households to absorb adverse shocks to their income—ie to smooth their consumption over time—by increasing secured borrowing, effectively mortgage equity withdrawal. I believe that the downside risks to house prices have since receded, but certainly not disappeared, and that the risks to consumption are (slightly) to the upside, even after the Committee agreed a higher central projection for consumption in August.

UK corporate sector adjustment

The UK corporate sector could hardly have been in a more different position from households over recent years. In contrast to strong household income growth, corporate profitability has been under pressure—across almost all sectors, but especially so in manufacturing, which since the mid-1990s has been adversely affected by sterling's strength and weakening external demand (see Chart 13). At an aggregate level, that has not stood in the way of debt accumulation (see Chart 14). But given the imbalances in the economy, it is misleading to look at aggregate data. Fortunately, plenty of disaggregated data are available—for individual firms,⁽¹⁾

Chart 13 Net rate of return on capital



Chart 14 PNFCs' capital and income gearing^(a)



a) Seasonally adjusted.

(b) PNFCs' net debt divided by the sum of net debt and their market valuations.
 (c) PNFCs' net debt divided by the total value of capital at replacement cost.

and by type of business. For example, much of the recent increase in bank debt has been in the real estate sector. But, again in contrast with the household sector, the data on bank borrowing are not sufficient to get a clear picture, as many public companies make extensive use of the capital markets to raise external finance.

Given the challenges in interpreting the raw data in this area, the Bank has for some years been holding six-monthly 'credit conditions' meetings with the major banks—in the run-up to the May and November *Inflation Reports* and the June and December *Financial Stability Reviews*—covering both corporate and household sector lending. This talk has drawn on those meetings, which I lead, working with colleagues from the monetary and financial stability teams in the Bank.

 Benito, A and Vlieghe, G (2000), 'Stylised facts on UK corporate financial health: evidence from micro-data', Bank of England Financial Stability Review, June, is one such study. It has been clear from these discussions that competition for middle-market corporate loan business is fairly intense, perhaps partly reflecting mergers in the UK banking sector. Indeed, conditions in this market have occasionally seemed independent from those in public bond and wholesale loan markets, which have been more affected by the global developments—and so at times by the reduced risk appetite—that I described earlier.

But if they have escaped the generalised tightening of credit conditions prevailing in US banking markets over the past few years, UK companies have, nevertheless, needed to adjust given falls in earnings (outside the oil sector). For example, an increasing proportion of dividend-paying companies has cut dividends (see Chart 15). And manufacturing companies have, in aggregate, been repaying bank debt (net) in recent years, as well as cutting jobs. Indeed, hours worked have fallen across the private sector as a whole, although it is difficult to gauge how much that reflects employee preferences and how much financial pressure on businesses.

Chart 15 Dividend payers with 2002 accounts reducing their dividend^(a)



Source: Thomson Financial Datastream.

(a) 2002 data contain 1,108 accounts, approximately 90% of the expected final number.

Perhaps reflecting these various steps, while it remains high by historical standards, capital gearing (measured on a replacement cost basis) has come off its 2001 peak, and most measures of sectoral liquidity appear strong. The insolvency rate remains low.

So, compared with the United States, it is not obvious that balance sheet pressures, or governance concerns, do as much to explain the persistent weakness in capital expenditure here. It seems just as plausible that many businesses have simply deferred investment in the face of uncertain demand prospects, including externally, and uncertain profitability. The MPC's August central projection has a gradual recovery in business investment. There are risks on either side of this. In the near term, it may well remain weaker than projected while the outlook for demand remains uncertain, but it could increase more sharply than assumed once demand palpably improves and deferred projects are brought on stream. The timing, though, is anyone's guess, so that the central projection is a sensible 'average' of different states of the world.

Credit conditions, money and inflation expectations

Much of this talk has revolved around credit conditions. I have concentrated on the United States and the United Kingdom, although credit conditions would be central to any analysis of Japan, and integral to most analyses of the euro area.

An observer at the Bank of England's briefings for the Monetary Policy Committee, and any reader of the minutes of our meetings, would indeed find that we have been devoting more time to credit than to money. And the emphasis has shifted since the 1980s, when bank lending was analysed as a counterpart to broad money (the assets that back banks' deposit liabilities). The stress now is rather on credit conditions as an identifiable element of the monetary transmission mechanism in their own right; one that often requires us to use analytical models alongside market intelligence on what is going on.

Some commentators would not be surprised by this, on the grounds that since the Bank of England (and other central banks) implement monetary policy by setting the price of base money (the official interest rate), its quantity is endogenous; and that the quantity of broad money is also demand determined. On that view, there is no incremental information from the monetary data; they merely have the advantage of being available early and of rarely being revised. There are perhaps at least two drawbacks with this account. First, it seems overly simplistic to assume that, in terms of financial prices, money demand is determined just by a two-week risk-free interest rate and expectations of its future path. It is surely more likely that money demand turns on a whole host of relative asset prices, ie not just on the risk-free rate set by the monetary authority but on

relative risk premia too.⁽¹⁾ But we cannot observe risk premia and do not understand much about how and why they vary over time. So interpreting the monetary data remains an important challenge.

Second, and rather more importantly, credit conditions as I have discussed them-eg credit spreads to compensate for risk, balance sheet robustness-are real rather than nominal economic variables. But inflationthe focus of monetary policy—is a nominal, or monetary, variable. Although successful monetary policy relies on keeping aggregate demand in line with aggregate supply, that leaves the steady-state inflation rate indeterminate as it is consistent with any stable rate of nominal expansion. The assessment of the inflation outlook cannot depend on real indicators alone, credit conditions included. Effective policy also relies on keeping medium-term inflation expectations in line with the $2^{1/2}$ % target; and the credibility of policy is, therefore, itself the nominal anchor. That underlies the Bank of England's attention to measures of inflation expectations, which are derived from the difference between nominal and real (ie strictly RPI-indexed) bonds and tracked by a battery of surveys.

So long as inflation expectations are so anchored, we can afford to focus on the balance of real demand and supply. But that expectations do appear to have been anchored should not seduce us into ignoring monetary (or nominal) barometers. Analysis of credit conditions is a complement to that, not a substitute for it. Credit conditions feed into the assessment of prospective demand pressures, and into gauging how any policy changes will be transmitted in the economy.

If the distinct role of nominal magnitudes and expectations is one vital point about the operation of policy, a second is the priority of getting the 'sign' of policy right. By that I mean that we are stimulating (or restraining) spending in the economy when we mean to. Our *de facto* instrument for doing so is the short-term real interest rate, ie the short-term nominal interest rate adjusted for expected inflation. Given that prices—and so expectations of short-term inflation—are sticky, we can more or less control the short-term real rate by setting the nominal interest rate in the money markets. By moving the short real rate above or below its 'natural' rate, we can bear down on or stimulate demand⁽²⁾ depending on the policy stance we wish to adopt given the outlook for inflation. So it is crucial to be able to gauge whether the short-term real interest rate has moved in the direction intended. Like lots of interesting and important economic variables, the 'natural' real interest rate cannot be directly observed and may itself vary in the face of demand or supply shocks. But on an assumption that such variation is small,⁽³⁾ reasonable proxies exist, including the long-run average *ex-post* real rate and the yield on long-maturity indexed-linked gilts.

Right now, and over the past couple of years, policy has, as intended, been accommodative on this measure. And judging by the price of short-maturity yields relative to long-maturity yields on inflation-linked bonds, policy is expected by the market to remain supportive for a while longer—but perhaps less so than expected a few months ago. The shift probably reflects an improved view of the outlook over recent months (see Chart 16).





(a) Difference between three-year spot sterling real interest rates and five-year real rates five years forward (constructed from index-linked gilts).

In reaching month-by-month decisions, it is important to place some weight on simply getting the sign right! In that way, we should be able to avoid big policy mistakes.

Conclusion

To conclude, the world economy remains delicately poised, with risks on the upside and downside relative to the MPC's August central projection. For some of those risks the assessment of credit conditions and sectoral balance sheets plays an important role. I have focused

⁽¹⁾ This way of thinking about money dates back at least to Brunner and Meltzer's work from the 1960s onwards,

summarised in 'Money and the economy; issues in monetary analysis', the 1987 Raffaele Mattioli Lectures.

⁽²⁾ This analysis goes back to Wicksell's Interest and prices (1898) and Lectures on political economy, volume II: money (1906).

⁽³⁾ See Neiss, K and Nelson, E (2001), 'The real interest rate gap as an inflation indicator', Bank of England Working Paper no. 130.

on that today rather than a broad overview of the outlook.

Against the background of central projections in which growth in both the United States and the euro area returns to trend from well below, I place the balance of risks to external demand for UK goods and services on the downside, in the near term at least. In the United States, because of the burden of adjustment-financial and, for want of a better term, cultural—on corporate America, I will not feel confident about a recovery in business investment spending until I see it in the data. Once it begins, though, I believe that it could be quite pronounced given the deferral of projects over the past couple of years. Meanwhile, there may be downside risks to US consumption—from continued labour shedding and from higher mortgage rates-although arguably balanced by the effects of substantial monetary and fiscal stimulus. The race between US investment and consumption remains unresolved. In the euro area, which I have not discussed today, I again see the near-term risks on the downside, partly because of the risks to global demand and partly because domestic demand prospects remain clouded by structural issues and a still-evolving macroeconomic policy framework.

If I continue to see the balance of risks to external demand for UK goods and services on the downside in the near term, I see upside risks to UK domestic demand, viz consumption, also in the near term. In particular, there is the possibility that households will borrow more against their homes in order to shield themselves against decelerating disposable incomes, although the recent rises in fixed-rate mortgage rates may dampen that somewhat.

That leaves UK monetary policy finely poised. At the MPC's August meeting, I was one of those who explored arguments for a rise, as well as those for a further cut, before concluding that 'no change' was the best place to be given the outlook for inflation.

But, given the debate about household debt, it is worth bearing in mind that the current level of short-term interest rates is most likely below their long-term average, so that personal finances would prudently be managed on the basis that rates are likely to be somewhat higher on average in the medium term. It is impossible to say when; we set rates a month at a time, and policy is rightly now supporting demand in order to keep inflation on track to meet the $2^{1}/_{2}$ % target.

Meanwhile, I am clear that the Committee will continue to need, as a matter of routine, to assess indicators of credit conditions and to draw on intelligence from the financial community, alongside the various other macroeconomic indicators, to which I can turn another day.

Bank of England speeches

Speeches made by Bank personnel since publication of the previous Bulletin are listed below.

Two current monetary policy issues.

Speech by Stephen Nickell, member of the Monetary Policy Committee and Professor at the London School of Economics, at a Market News International Seminar on 16 September 2003. www.bankofengland.co.uk/speeches/speech202.pdf.

Credit conditions and monetary policy.

Speech by Paul Tucker, executive director and member of the Monetary Policy Committee, at the Leeds Financial Services Initiative on 28 August 2003. www.bankofengland.co.uk/speeches/speech201.pdf. Reproduced on pages 366–78 of this *Bulletin*.

Asset prices, financial imbalances and monetary policy: are inflation targets enough?

Paper by Charles Bean, Chief Economist and member of the Monetary Policy Committee, in New South Wales, Australia on 19 August 2003. www.bankofengland.co.uk/speeches/speech200.pdf.

Employment and taxes.

Speech by Stephen Nickell, member of the Monetary Policy Committee and Professor at the London School of Economics, at the Centre for Economic Studies, Institute for Economic Research Conference in Venice on 21 July 2003. www.bankofengland.co.uk/speeches/speech199.pdf.

Mansion House speech.

Speech by The Rt Hon Sir Edward George, Governor, at the Lord Mayor's Banquet for Bankers and Merchants of the City of London, Mansion House on 18 June 2003. www.bankofengland.co.uk/speeches/speech197.htm.

Contents of recent Quarterly Bulletins

The articles and speeches which have been published recently in the *Quarterly Bulletin* are listed below. Articles from November 1998 onwards are available on the Bank's web site at www.bankofengland.co.uk/qbcontents/index.html.

Articles and speeches (indicated S)

Summer 2001

The Bank of England inflation attitudes survey The London Foreign Exchange Joint Standing Committee: a review of 2000 Over-the-counter interest rate options Explaining the difference between the growth of M4 deposits and M4 lending: implications of recent developments in public finances Using surveys of investment intentions Can differences in industrial structure explain divergencies in regional economic growth? Has there been a structural improvement in US productivity? International efforts to improve the functioning of the global economy (S) Monetary stability as a foundation for sustained growth (S) The 'new economy': myths and realities (S) The impact of the US slowdown on the UK economy (S)

Autumn 2001

Public attitudes about inflation: a comparative analysis
Measuring capital services in the United Kingdom Capital flows and exchange rates
Balancing domestic and external demand (S)
The international financial system: a new partnership (S)
'Hanes Dwy Ddinas' or 'A Tale of Two Cities' (S)
Has UK labour market performance changed? (S)
Some reflections on the MPC (S)

Winter 2001

The external balance sheet of the United Kingdom: implications for financial stability

- Public sector debt: end-March 2001
- The foreign exchange and over-the-counter derivatives markets in the United Kingdom

The Bank's contacts with the money, repo and stock lending markets

The formulation of monetary policy at the Bank of England

Credit channel effects in the monetary transmission mechanism

Winter 2001 (continued)
Financial effects on corporate investment in UK business cycles
Why house prices matter
The prospects for the UK and world economies (S)
Maintaining financial stability in a rapidly changing world: some threats and opportunities (S)
Monetary policy: addressing the uncertainties (S)
Economic imbalances and UK monetary policy (S)
Do we have a new economy? (S)
Spring 2002
The London Foreign Exchange Joint Standing Committee: a review of 2001
Provision of finance to smaller quoted companies: some

evidence from survey responses and liaison meetings Explaining trends in UK business investment

Building a real-time database for GDP(E)

Electronic trading in wholesale financial markets: its wider impact and policy issues

Analysts' earnings forecasts and equity valuations On market-based measures of inflation expectations Equity wealth and consumption—the experience of

Germany, France and Italy in an international context Monetary policy, the global economy and prospects for the United Kingdom (S)

- Three questions and a forecast (S)
- Twenty-first century markets (S)

The stock market, capacity uncertainties and the outlook for UK inflation (S)

Summer 2002

Public attitudes to inflation

The Bank of England's operations in the sterling money markets

No money, no inflation—the role of money in the economy

Asset prices and inflation

Durables and the recent strength of household spending Working time in the United Kingdom: evidence from the Labour Force Survey

Why are UK imports so cyclical?

Monetary challenges (S)

The Monetary Policy Committee: five years on (S)

Summer 2002 (continued)

Household indebtedness, the exchange rate and risks to the UK economy (S)

Autumn 2002

growth

Committees versus individuals: an experimental analysis of monetary policy decision-making Parliamentary scrutiny of central banks in the United Kingdom and overseas Ageing and the UK economy The balance-sheet information content of UK company profit warnings Money and credit in an inflation-targeting regime International Financial Architecture: the Central Bank Governors' Symposium 2002 The monetary policy dilemma in the context of the international environment (S) Monetary policy issues: past, present, future (S) Winter 2002 What do measures of core inflation really tell us? Estimating the impact of changes in employers' National Insurance Contributions on wages, prices and employment Equity valuation measures: what can they tell us? Profit expectations and investment Financial pressures in the UK household sector: evidence from the British Household Panel Survey Money market operations and volatility in UK money market rates The Centre for Central Banking Studies The external balance sheet of the United Kingdom: recent developments Public sector debt: end-March 2002 Speech at the Northwest Development Agency/Bank of England Dinner (S) The inflation target ten years on (S) The MPC and the UK economy: should we fear the D-words? (S) Macroeconomic policy rules in theory and in practice (S) Spring 2003 Market-based estimates of expected future UK output

Spring 2003 (continued) Monetary policy and the zero bound to nominal interest rates The measurement of house prices Report on modelling and forecasting at the Bank of England The Bank's regional Agencies A review of the work of the London Foreign Exchange Joint Standing Committee in 2002 Speech at the Chartered Institute of Bankers in Scotland **Biennial Dinner (S)** Economists and the real world (S) Adjusting to low inflation—issues for policy-makers (S) Six months on the MPC: a reflection on monetary policy (S) House prices, household debt and monetary policy (S) Summer 2003 What caused the rise in the UK terms of trade? Long-run equilibrium ratios of business investment to output in the United Kingdom An analysis of the UK gold auctions 1999-2002 Assessing the extent of labour hoarding Asset finance Public attitudes to inflation Foreign Exchange Joint Standing Committee

e-commerce subgroup report The Governor's speech at the Islamic Home Finance seminar on 27 March 2003 (S) The role of the Bank of England in the gold market (S)

Autumn 2003

Trends in households' aggregate secured debt
Public expectations of UK inflation
Non-employment and labour availability
The information content of regional house prices:
can they be used to improve national house price forecasts?
Balance sheet adjustment by UK companies
Inflation targeting and the fiscal policy regime: the experience in Brazil
The optimal rate of inflation: an academic perspective
The EU Financial Services Action Plan: a guide
Credit conditions and monetary policy (S)

Bank of England publications

The Bank of England publishes information on all aspects of its work in many formats. Listed below are some of the main Bank of England publications. For a full list, please refer to our web site www.bankofengland.co.uk/publications.

Working papers

Working papers are free of charge; a complete list is available from the address below. An up-to-date list of working papers is also maintained on the Bank of England's web site at www.bankofengland.co.uk/wp/index.html, where abstracts of all papers may be found. Papers published since January 1997 are available in full, in PDF.

No.	Title	Author
110	Imperfect competition and the dynamics of mark-ups (February 2000)	Erik Britton Jens D J Larsen Ian Small
111	Liquidity traps: how to avoid them and how to escape them (April 2000)	Willem H Buiter Nikolaos Panigirtzoglou
112	Inventory investment and cash flow (May 2000)	Ian Small
113	A small structural empirical model of the UK monetary transmission mechanism (May 2000)	Shamik Dhar Darren Pain Ryland Thomas
114	Testing the stability of implied probability density functions (May 2000)	Robert R Bliss Nikolaos Panigirtzoglou
115	Trade credit and the monetary transmission mechanism (June 2000)	Marion Kohler Erik Britton Tony Yates
116	Persistence and volatility in short-term interest rates (June 2000)	Nikolaos Panigirtzoglou James Proudman John Spicer
117	A limited participation model of the monetary transmission mechanism in the United Kingdom <i>(June 2000)</i>	Shamik Dhar Stephen P Millard
118	How well does a limited participation model of the monetary transmission mechanism match UK data? (June 2000)	Shamik Dhar Stephen P Millard
119	Optimal horizons for inflation targeting (July 2000)	Nicoletta Batini Edward Nelson
120	UK monetary policy 1972-97: a guide using Taylor rules (July 2000)	Edward Nelson
121	Sovereign liquidity crises: analytics and implications for public policy (September 2000)	Michael Chui Prasanna Gai Andrew G Haldane
122	Direct effects of base money on aggregate demand: theory and evidence (October 2000)	Edward Nelson
123	An analysis of the relationship between international bond markets (December 2000)	Andrew Clare Ilias Lekkos
124	Age structure and the UK unemployment rate (December 2000)	Richard Barwell
125	Assessing the impact of macroeconomic news announcements on securities prices under different monetary policy regimes <i>(February 2001)</i>	Andrew Clare Roger Courtenay
126	New estimates of the UK real and nominal yield curves (March 2001)	Nicola Anderson John Sleath
127	Sticky prices and volatile output (April 2001)	Martin Ellison Andrew Scott
128	'Oscillate Wildly': asymmetries and persistence in company-level profitability (April 2001)	Andrew Benito
129	Investment-specific technological progress in the United Kingdom (April 2001)	Hasan Bakhshi Jens Larsen

130	The real interest rate gap as an inflation indicator (April 2001)	Katharine S Neiss Edward Nelson
131	The structure of credit risk: spread volatility and ratings transitions (May 2001)	Rudiger Kiesel William Perraudin Alex Taylor
132	Ratings versus equity-based credit risk modelling: an empirical analysis (May 2001)	Pamela Nickell William Perraudin Simone Varotto
133	Stability of ratings transitions (May 2001)	Pamela Nickell William Perraudin Simone Varotto
134	Consumption, money and lending: a joint model for the UK household sector (May 2001)	K Alec Chrystal Paul Mizen
135	Hybrid inflation and price level targeting (May 2001)	Nicoletta Batini Anthony Yates
136	Crisis costs and debtor discipline: the efficacy of public policy in sovereign debt crises (May 2001)	Prasanna Gai Simon Hayes Hyun Song Shin
137	Leading indicator information in UK equity prices: an assessment of economic tracking portfolios (May 2001)	Simon Hayes
138	PPP and the real exchange rate-real interest rate differential puzzle revisited: evidence from non-stationary panel data <i>(June 2001)</i>	Georgios E Chortareas Rebecca L Driver
139	The United Kingdom's small banks' crisis of the early 1990s: what were the leading indicators of failure? (July 2001)	Andrew Logan
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141	The fallacy of the fiscal theory of the price level, again (July 2001)	Willem H Buiter
142	Band-pass filtering, cointegration, and business cycle analysis (September 2001)	Luca Benati
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146	Indicators of fragility in the UK corporate sector (December 2001)	Gertjan W Vlieghe
147	Hard Times or Great Expectations?: Dividend omissions and dividend cuts by UK firms (December 2001)	Andrew Benito Garry Young
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153	Do changes in structural factors explain movements in the equilibrium rate of
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- 156 Equilibrium exchange rates and supply-side performance (June 2002)
- 157 Financial liberalisation and consumers' expenditure: 'FLIB' re-examined (July 2002)
- 158 Soft liquidity constraints and precautionary saving (July 2002)
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- 161 Regulatory and 'economic' solvency standards for internationally active banks (*August 2002*)
- 162 Factor utilisation and productivity estimates for the United Kingdom (August 2002)
- 163 Productivity versus welfare: or, GDP versus Weitzman's NDP (August 2002)
- 164 Understanding UK inflation: the role of openness (September 2002)
- 165 Committees versus individuals: an experimental analysis of monetary policy decision-making *(September 2002)*
- 166 The role of corporate balance sheets and bank lending policies in a financial accelerator framework *(September 2002)*
- 167 The role of short-run inflation targets and forecasts in disinflation (October 2002)
- 168 Financial pressure and balance sheet adjustment by UK firms (October 2002)
- 169 House prices, consumption, and monetary policy: a financial accelerator approach (*December 2002*)
- 170 Base rate pass-through: evidence from banks' and building societies' retail rates (December 2002)
- 171 Leading indicators of balance-of-payments crises: a partial review (December 2002)
- 172 Public demand for low inflation (January 2003)
- 173 Current accounts, net foreign assets and the implications of cyclical factors *(January 2003)*
- 174 Money market operations and volatility of UK money market rates (January 2003)
- 175 Equilibrium analysis, banking, contagion and financial fragility (February 2003)
- 176 Rational expectations and fixed-event forecasts: an application to UK inflation (*February 2003*)
- 177 The provisioning experience of the major UK banks: a small panel investigation *(February 2003)*

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Gianluca Benigno Christoph Thoenissen

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Paul Mizen Boris Hofmann

Michael Chui

Kenneth Scheve

Matthieu Bussiere Georgios Chortareas Rebecca L Driver

Anne Vila Wetherilt

Dimitrios P Tsomocos

Hasan Bakhshi George Kapetanios Anthony Yates

Darren Pain

179	A Kalman filter approach to estimating the UK NAIRU (March 2003)	:]]
180	The role of expectations in estimates of the NAIRU in the United States and the United Kingdom <i>(March 2003)</i>	, 1]
181	Procyclicality and the new Basel Accord—banks' choice of loan rating system (March 2003)]
182	Import prices and exchange rate pass-through: theory and evidence from the United Kingdom (March 2003)	0
183	Capital flows to emerging markets (April 2003)	I
184	The effect of payments standstills on yields and the maturity structure of international debt (<i>April 2003</i>)	/
185	What does economic theory tell us about labour market tightness? (April 2003)	1
186	Ready, willing, and able? Measuring labour availability in the UK (April 2003)	ĺ
187	Sovereign debt workouts with the IMF as delegated monitor—a common agency approach (May 2003)]]
188	The role of asset prices in transmitting monetary and other shocks (May 2003)	0
189	Modelling investment when relative prices are trending: theory and evidence for the United Kingdom (May 2003)	l I J
190	What caused the 2000/01 slowdown? Results from a VAR analysis of G7 GDP components (May 2003)	1
191	Endogenous price stickiness, trend inflation, and the New Keynesian Phillips curve (May 2003)]
192	Capital stocks, capital services, and depreciation: an integrated framework (June 2003)	l I S
193	Implicit interest rates and corporate balance sheets: an analysis using aggregate and disaggregated UK data (June 2003)	J
194	A Merton-model approach to assessing the default risk of UK public companies (June 2003)	1
195	Forecasting inflation using labour market indicators (July 2003)	1
196	UK business investment: long-run elasticities and short-run dynamics (July 2003)	(
197	E-barter versus fiat money: will central banks survive? (August 2003)]
198	Non-interest income and total income stability (August 2003)	(] ((
199	Credit risk diversification: evidence from the eurobond market (September 2003)	e.

178 The impact of price competitiveness on UK producer price behaviour (March 2003)

Colin Ellis Simon Price

Jennifer V Greenslade Richard G Pierse Jumana Saleheen

Rebecca L Driver Jennifer V Greenslade Richard G Pierse

Eva Catarineu-Rabell Patricia Jackson Dimitrios P Tsomoco

Valerie Herzberg George Kapetanios Simon Price

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Rosie Smith Christos Staikouras Geoffrey Wood

Simone Varotto

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 web site at www.bankofengland.co.uk/mpc/extmpcpaper0000n.pdf (where n refers to the paper number). The following papers have been published recently.

No.	Title	Author
9	The pricing behaviour of UK firms (April 2002)	Nicoletta Batini Brian Jackson Stephen Nickell
10	Macroeconomic policy rules in theory and in practice (October 2002)	Christopher Allsopp
11	The exchange rate and inflation in the UK (October 2002)	Amit Kara Edward Nelson
12	Measuring the UK short-run NAIRU (April 2003)	Nicoletta Batini Jennifer Greenslade
13	UK consumers' habits (May 2003)	Ryan Banerjee Nicoletta Batini

Monetary and Financial Statistics

Monetary and Financial Statistics (Bankstats) contains detailed information on money and lending, monetary and financial institutions' balance sheets, analyses of bank deposits and lending, international business of banks, public sector debt, money markets, issues of securities and short-term paper, interest and exchange rates, explanatory notes to tables, and occasional related articles. Bankstats is published quarterly in paper form, priced at £60 per annum in the United Kingdom (four issues). It is also available monthly free of charge from the Bank's web site at: www.bankofengland.co.uk/mfsd/latest.htm.

Further details are available from: Daxa Khilosia, Monetary and Financial Statistics Division, Bank of England: telephone 020 7601 5353; fax 020 7601 3208; e-mail daxa.khilosia@bankofengland.co.uk.

The following articles have been published in recent issues of *Monetary and Financial Statistics*. They may also be found on the Bank of England web site at www.bankofengland.co.uk/mfsd/030901/aug03articles.htm.

Title	Author	Month of issue	Page numbers
UK monetary aggregates: main definitional changes		July	4-6
Electronic access to official financial statistics: a report on a meeting of the Financial Statistics Users' Group	Karen Westley	July	1-3
A work programme in financial statistics—April 2003 update	Simon Humphries Ben Norman	April	1-5

Financial Stability Review

The *Financial Stability Review* is published twice a year, in June and December. 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 policy-makers in the United Kingdom and abroad; international financial institutions; academics; journalists; market infrastructure providers; and financial market participants. It is available from Financial Stability Review, Bank of England HO-3, Threadneedle Street, London, EC2R 8AH and on the Bank's web site at: www.bankofengland.co.uk/fsr/index.htm.

Practical issues arising from the euro

This is a series of booklets providing a London perspective on the development of euro-denominated financial markets and the supporting financial infrastructure, and describing the planning and preparation for possible future UK entry. Recent editions have focused on the completion of the transition from the former national currencies to the euro in early 2002, and the lessons that may be drawn from it. Copies are available from Public Enquiries Group, Bank of England, Threadneedle Street, London, EC2R 8AH and at the Bank's web site at: www.bankofengland.co.uk/euro/piq.htm.

Economic models at the Bank of England

The *Economic models at the Bank of England* book, published in April 1999, contains details of the economic modelling tools that help the Monetary Policy Committee in its work. The price of the book is £10.00. An update was published in September 2000 and is available free of charge.

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.

Back issues of the *Quarterly Bulletin* from 1981 are available for sale. Summary pages of the *Bulletin* from February 1994, giving a brief description of each of the articles, are available on the Bank's web site at www.bankofengland.co.uk/bulletin/index.html.

The *Bulletin* is also available from ProQuest Information and Learning: enquiries from customers in Japan and North and South America should be addressed to ProQuest Information and Learning, 300 North Zeeb Road, Ann Arbor, Michigan 48106, 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.

Bound volumes of the *Quarterly Bulletin* for the period 1960–85 (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 \notin 105 per volume or \notin 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 Report starts with an overview of economic developments; this is followed by six sections:

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

The minutes of the meetings of the Bank's Monetary Policy Committee (previously published as part of the *Inflation Report*) now appear as a separate publication on the same day as the *Report*.

Publication dates

From 2003, copies of the *Quarterly Bulletin* and *Inflation Report* can be bought separately, or as a combined package for a discounted rate. Current prices are shown overleaf. Publication dates for 2003 are as follows:

Quarterly Bulletin		Inflation Report		
Spring	21 March	February	12 February	
Summer	20 June	Mav	15 May	
Autumn	26 September	August	13 August	
Winter	19 December	November	12 November	

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£33.00	£9.00	£25.00	£7.00	£13.00	£4.00
£43.00	£12.00	£34.00	£9.00	£17.00	£5.00
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