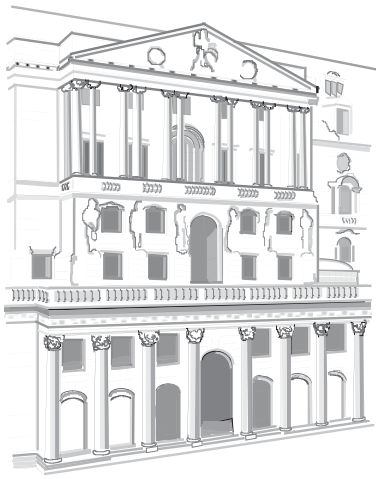
Bank of England Quarterly Bulletin



November 1998

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The Quarterly Bulletin and Inflation Report

Inflation Report
(published separately)

The *Inflation Report* reviews developments in the UK economy and assesses the outlook for UK inflation over the next two years in relation to the inflation target. The *Report* starts with a short overview section, while the second investigates money and financial markets and the following three sections examine demand and output, the labour market and pricing behaviour respectively. The concluding sections present a summary of monetary policy since the August *Report*, an assessment of medium-term inflation prospects and risks, and information about non-Bank forecasts.

Markets and operations
(pages 301–13)

The focus of UK financial markets shifted from domestic to international developments halfway through the third quarter. International conditions changed sharply in mid August, as the rouble depreciated and Russia announced a rescheduling of its debt obligations. Confidence in several other emerging markets in Asia and Latin America subsequently weakened. Investors reassessed their risk exposure, moving away from the liabilities of emerging market countries, banks, and equities, and favouring the most liquid government bond and money-market sectors. These trends were difficult to distinguish from the effects of a change in the markets' view of the likely course of monetary policy, as forecasts for world growth were revised downwards. Long-dated gilt yields fell to their lowest levels since the late 1950s, alongside a sharp fall in bond yields for the main industrialised economies. After peaking in July, largely in tandem with US equities, UK share prices fell over the next six weeks, leaving the market near its end-1997 level. By the end of September, Japan and the United States had eased monetary policy, and markets were discounting a cut in UK official interest rates within the next two months. Implied short-term interest rates fell over the quarter, and sterling fell by 3½% in effective terms.

The international environment
(pages 314–23)

Events this quarter have been dominated by financial market turbulence, following a debt moratorium in Russia and risks of contagion affecting Latin America. Global equity prices have fallen, and credit spreads on emerging market debt have widened. Underlying activity in the major industrial economies except Japan remained firm in the second quarter. But subsequent falls in both business and consumer confidence pose risks for the deteriorating global outlook and growth in 1999. The Japanese economy fell further into recession, with its weakest growth since 1955. Confidence indicators remained low, and there were as yet few signs of the fiscal stimulus contributing to activity. Inflationary pressures were extremely weak in the major industrial economies, largely reflecting falls in commodity prices. The United States and Japan eased monetary policy in 1998 Q3. The prospective euro area also experienced a monetary easing, as countries with higher official interest rates reduced them. Bond yields fell in the major markets, partly reflecting a flight to quality. The Japanese benchmark bond yield fell to record low levels.

Public sector debt: end March 1998
(pages 324–37)

This article continues the annual series in the *Quarterly Bulletin* analysing the debt position of the UK public sector. It looks at developments in net and gross debt in the financial year to end March 1998, and examines some of the domestic and European issues that have influenced these measures. It also analyses the composition and distribution of the national debt.

Research and analysis

(pages 338–67)

Research work published by the Bank is intended to contribute to debate, and is not necessarily a statement of Bank policy.

Inflation and growth in a service economy (by DeAnne Julius, member of the Bank's Monetary Policy Committee and John Butler of the Bank's Conjunctural Assessment and Projections Division). This article sets out the initial findings of a project team set up by the Bank to examine the behaviour of the service sector, in the light of the increasingly important role that services play in the UK economy, and so in achieving the Government's inflation target. It presents a series of stylised facts about the service sector between 1970–97, and notes areas for further work.

The foreign exchange and over-the-counter derivatives markets in the United Kingdom (by Jamie Thom of the Bank's Foreign Exchange Division and Jill Paterson and Louise Boustani of the Bank's Markets and Trading Systems Division). In April this year, the Bank of England conducted its regular survey of turnover in the United Kingdom foreign exchange and over-the-counter (OTC) derivatives markets, as part of the latest worldwide survey organised by the Bank for International Settlements (BIS). The foreign exchange market survey has been conducted triennially since 1986, and a parallel survey of the OTC derivatives markets was first conducted in 1995. This article sets out the results (in US$ billion), and compares them with the 1995 survey and results for other major centres.

Recent changes to the national accounts, balance of payments and monetary statistics (by Anna Brueton of the Office for National Statistics and John Thorp of the Bank's Monetary and Financial Statistics Division). In September 1998, the Office for National Statistics made major changes to the presentation of the UK National Accounts. This article summarises these changes and complementary changes to the balance of payments statistics and to the banking and monetary statistics produced by the Bank. The November *Inflation Report* contains a description of the impact of the changes on the National Accounts, and an assessment of the UK economy based on the new data.

This summary is also available from the Bank's web site at www.bankofengland.co.uk/summary.htm.

Markets and operations

- *The Bank's repo rate was left unchanged in the third quarter.*
- *Implied interest rates given by the December short sterling contract fell by around 90 basis points.*
- *Long-dated gilt yields fell to their lowest levels since the late 1950s.*
- *UK equities fell back to around their end-1997 level after reaching a record peak in July.*
- *Sterling fell during the period as the markets expected the UK repo rate to be reduced.*
- *International developments had a greater influence on the markets from the middle of the quarter.*

Overview

During the early part of the third quarter, the UK financial markets focused on domestic developments and their implications for monetary policy; market participants thought that official interest rates might be raised. But less robust economic figures, and survey evidence suggesting prospective economic weakness, largely dispelled this view by early August.

The focus of UK financial markets shifted from domestic to international developments halfway through the third quarter. International conditions changed sharply in mid August, as the rouble depreciated and Russia announced a rescheduling of its debt obligations. Confidence in several other emerging markets in Asia and Latin America subsequently weakened, against a background of doubt about how quickly IMF resources would be replenished. The news that several major financial institutions in the United States and Europe had suffered losses on their exposure to Russia brought fresh falls in equity markets in the major industrial countries.

Investors consequently reassessed their risk, moving away from the liabilities of emerging market countries, banks, and equities, and favouring the most liquid government bond and money-market sectors. These trends were difficult to distinguish from the effects of a change in the markets' view of the likely course of monetary policy, as forecasts for world growth were revised downwards. The US hedge fund Long Term Capital Management was believed to have large short positions in a number of assets that subsequently came into demand. Long-dated gilt yields fell to their lowest levels since the late 1950s, alongside a sharp fall in bond yields for the main industrialised economies. Fixed-income credit and swap spreads widened sharply, beyond the levels reached during the Asian crisis in autumn 1997. After peaking in July, largely in tandem with US equities, UK share prices fell over the next six weeks, leaving the market near its end-1997 level. By the end of September, Japan and the United States had eased monetary policy, and markets were discounting a cut in UK official interest rates

Chart 1
Rouble versus the US dollar

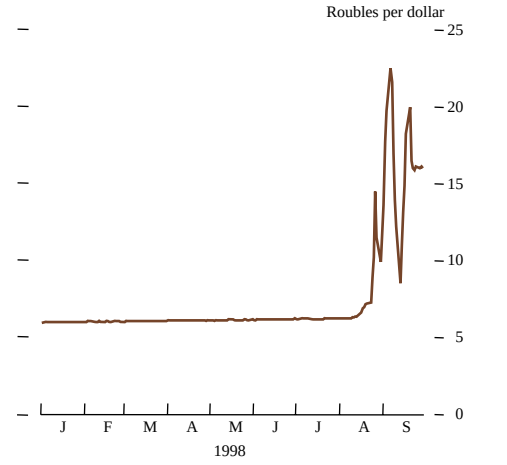
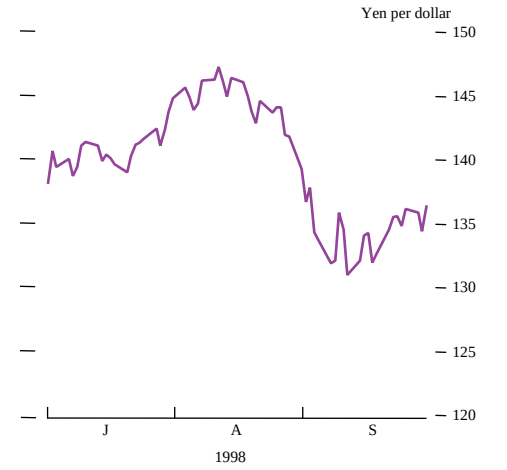


Table A
Emerging market currencies versus the US dollar

	1997		1998		Percentage changes between 30 June and 30 Sept. 1998 (a)
	1 July	31 Dec.	30 June	30 Sept.	
Indonesian rupiah	2,432	5,550	14,800	10,700	38.3
Thai baht	24.5	47.1	42.2	39.6	6.7
Korean won	888	1,695	1,373	1,390.8	-1.3
Philippine peso	26.37	40.50	41.70	43.75	-4.7
South African rand	4.53	4.87	5.97	5.95	0.3
Brazilian real	1.08	1.12	1.16	1.18	-2.3
Mexican peso	7.93	8.07	8.97	10.28	-12.7
Venezuelan bolivar	487.30	504.30	553.00	573.50	-3.6

(a) A positive number represents local currency appreciation.

Chart 2
US dollar versus yen



within the next two months. Implied short-term interest rates and gilt yields fell over the quarter, and sterling fell by 3½% in effective terms.

Market developments

Foreign exchange

(i) International background

Developments in the foreign exchange markets were dominated by the turmoil in emerging markets. This started with the announcement on 17 August of, in effect, a devaluation of the Russian rouble and a moratorium on Russian debt repayments. Having traded at around six roubles to the US dollar until early August, the rouble depreciated sharply (see Chart 1). It reached a low of more than 20 roubles to the dollar in early September on the official exchanges, but was even lower in unofficial trading. The dismissal of the Russian Prime Minister and the rest of the Cabinet in the second half of August, and subsequent uncertainty about who would succeed them, contributed to market volatility. Imposition of capital controls in Malaysia on 1 September raised concerns that other emerging market economies would follow suit.

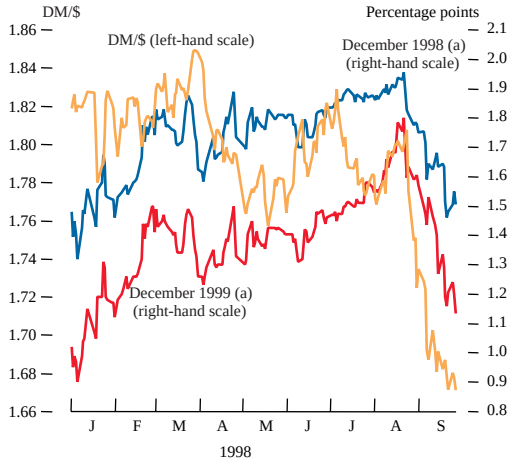
The Russian turmoil spread to other markets through a number of channels: debt exposure; a review of the risk of default in other emerging markets; and equity prices. The first of these initially most affected German banks (and therefore the Deutsche Mark) because of their relatively large exposure to Russia, though much of this was backed by official guarantees; non-German banks also announced losses on account of their exposure to Russia.

The general review of default risk contributed to exchange rate turbulence in many emerging markets, particularly in Latin America (see Table A). As asset prices fell in emerging markets, financial institutions sought to meet margin calls by booking profits from previous portfolio positions. Unwinding of long dollar positions against the yen ('carry trades') helped to account for the appreciation of the yen against the dollar in late August/early September (see Chart 2), despite the easing in Japanese monetary policy. The Bank of Japan guided the overnight call rate down by 25 basis points to 0.25% on 9 September, and stated that it would provide the necessary funds to maintain the stability of the financial markets.

Falls in equity prices in industrialised countries (see later section, page 308) added to the probability of lower world growth through wealth effects. The weaker prospects for world growth, in turn, added further downward pressure to commodity prices, which affected the exchange rates of many major commodity exporters. Both the Canadian and Australian dollars hit historic lows against the US dollar during the third quarter.

The US dollar depreciated against the Deutsche Mark during September, as expectations of an imminent cut in US interest rates became more widespread. That partly reflected concern about the spread of emerging market turmoil to Latin America, which has greater trade and investment links with the United States than with other major economies. It may have also reflected a view that falls in domestic equity prices would have a larger impact

Chart 3
US and German interest rate differential and exchange rate



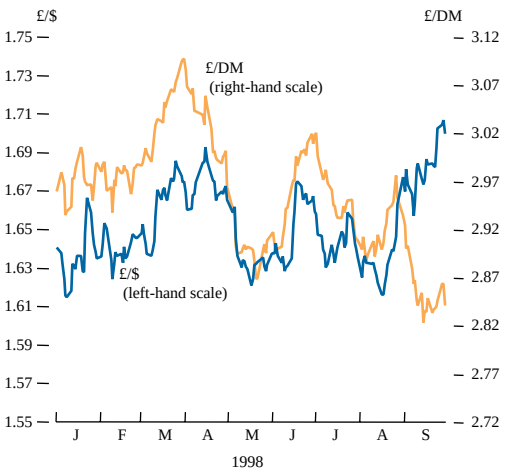
(a) Difference in three-month interest rates implied by futures contracts of specified dates.

Table B
European currencies and interest rates during the third quarter

Basis points; *percentages in italics*

	Change versus DM	Change in official interest rates	Change in government bond spread versus Germany
French franc	*0.0*	0	+10
Italian lira	*-0.4*	0	+17
Greek drachma	*-2.1*	-300	+140
Danish krone	*0.2*	+100	+53
Norwegian krone	*-4.3*	+350	+60
Swedish krona	*-6.2*	0	+63
Finnish markka	*-0.2*	0	+26

Chart 4
Sterling exchange rates



on the US economy than on others, because of the greater prevalence of personal share holding in the United States. Chart 3 shows that the dollar's depreciation against the Deutsche Mark coincided with downward revisions to the expected path of US interest rates relative to German rates during the rest of 1998 and 1999.

On 29 September, the Federal Reserve lowered the official target for the fed funds rate by 25 basis points, to 5.25%. This had been largely anticipated by the markets, but there was some disappointment that the reduction was not larger, and was not accompanied by a lowering of the discount rate; immediately following the reduction, the dollar held up reasonably well, but the move was seen as acknowledging that economic growth was slowing.

The cross-exchange rates of countries signed up to join the single currency were largely unchanged during the third quarter (see Table B). But other European currencies were more volatile. The Norwegian krone, for example, fell by around 8% against the Deutsche Mark between the end of June and the end of August, despite four rises in official Norwegian interest rates (from 6½% to 10%), but then recovered. The Swedish krona depreciated by around 6% during the same period. Though the Danish krone did not move much against the Deutsche Mark, there were signs of pressure, and official interest rates were raised by 1 percentage point in mid September to defend the currency. By contrast, in Finland, a 'euro-in', official interest rates were unchanged during the third quarter, and government bond yield differentials with Germany widened less than in other Scandinavian countries.

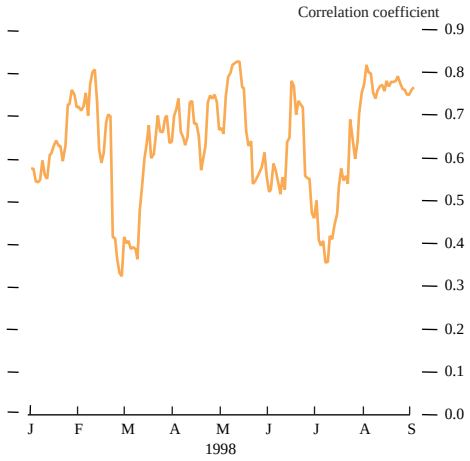
(ii) Sterling

The sterling effective exchange rate fell by 3½% during the third quarter to 103.3 on 30 September. Sterling initially depreciated steadily against the Deutsche Mark, as further signs of UK economic slowdown emerged. But then the news from Russia contributed to sterling's rise by around 8 pfennigs, as 'safe-haven' flows initially avoided Germany because of its relatively large exposure to Russia. Thereafter, the pound fell against the Deutsche Mark, ending the quarter at around DM 2.85 (see Chart 4).

The fall in sterling against the Deutsche Mark later in the quarter partly reflected the dollar's weakness. The correlation between daily changes in sterling and the dollar was unusually high in September (see Chart 5). That close correlation probably reflected similar changes in expectations for US and UK short-term interest rates. In turn, this was influenced by market perception of the similarity in the two countries' cyclical positions, and in statements made by their monetary authorities in September.

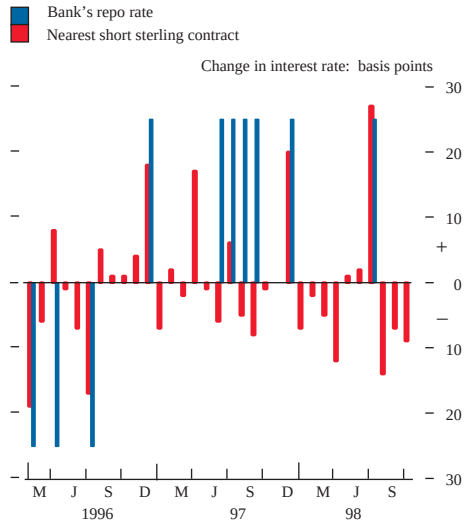
Sterling appreciated immediately after the MPC's decision in September to leave interest rates unchanged. But as the market digested the accompanying statement that the Committee 'recognised that deterioration in the international economy could increase the risks of inflation falling below the target', sentiment shifted, and the pound gradually drifted downwards, ending the day 2 pfennigs lower against the Deutsche Mark. Sterling also moved sharply in reaction to the combination of GDP and current account data for the second quarter, both released on 24 September. The

Chart 5
Correlations between US dollar and sterling(a)



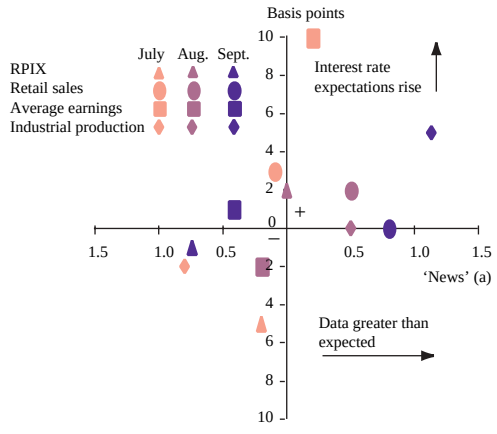
(a) Measured by 20-day rolling window of correlations between daily movements in DM/$ and DM/£.

Chart 6
Interest rate announcements: change in nearest short sterling contract(a)



(a) In contract-switching months (March, June, September and December), the contract that expires three months ahead was used.

Chart 7
Effect of data releases on interest rate expectations from July to September 1998



(a) 'News' is measured as data outturn less expected, divided by standard deviation of past surprises. Interest rate expectations are measured by the impact on the nearest short sterling contract. July and August data are for close of business to close of business, whereas September is the ten-minute reaction to the data releases.

upward revision to the level of GDP, and an unexpected shift into surplus on the current account, underpinned sterling, which rose by more than ½% on its effective exchange rate index during the day.

Short-term interest rates

Though the MPC left the official repurchase (repo) rate unchanged in the third quarter, short-term interest rates expected by the market fell. Early in the quarter, markets remained nervous about the direction of rates following June's rate rise; macroeconomic data emerging in June were stronger than the market expected. Attention was largely focused on the domestic developments and their implications for monetary policy. As the quarter progressed, the domestic conjuncture seemed less likely to provoke a further increase in interest rates and, after mid August, attention focused more on international developments. Consequently, rate expectations fell.

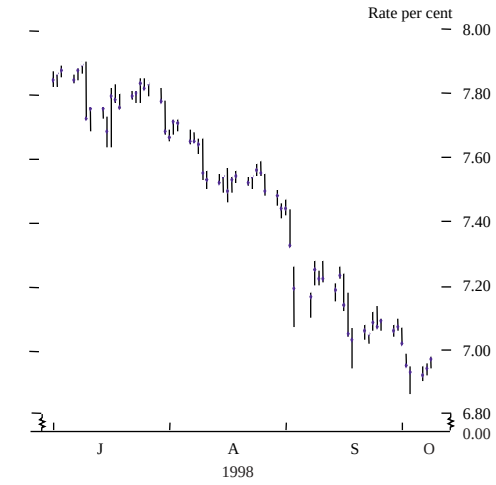
There is evidence that the markets considered that a rate rise was possible at the July and August MPC meetings. Following the announcement that policy had been left unchanged at these two meetings, the rate implied by the nearest short sterling futures contracts fell (see Chart 6).

Economic data released had less impact on market expectations as the quarter progressed. This may partly have reflected the fact that some of the statistics published in August and September were broadly in line with market expectations (see Chart 7), but also reflected the relatively greater emphasis that the market was placing on international developments and equity prices.

By early August, the view that interest rates had peaked was more widespread. Although concern about higher rates was aggravated in early July by the publication of average earnings data, markets soon started to focus on signs that the slowdown in the economy was spreading from the manufacturing to the service sector. These concerns were reinforced by the publication of the CIPS manufacturing and services survey, and the CBI Distributive Trades survey in early August. Towards the middle of August, expectations that further rate rises were unlikely gained ground as lower earnings data emerged.

Interest rate expectations fell sharply after mid August (see Chart 8), in response to the developments in Russia and continuing concerns about Japan. Western stock markets suffered as investors sought 'safe havens'. Investors targeted short-dated US Treasury bills and notes and, to a lesser extent, sterling money-market instruments. By early September, the markets were looking closely for signs that international developments would affect the monetary policy stance in the major economies. Federal Reserve Chairman Greenspan said that it was 'just not credible for the United States to remain an oasis of prosperity unaffected by a world that is experiencing greatly increased stress.' Markets took this as a strong hint that US interest rates would be lowered sooner than previously thought. In early September, the Bank of Japan eased monetary policy. In response to market speculation, it subsequently stated that this was not part of a co-ordinated rate cut planned by the major industrialised economies. But the markets had been surprised by the move, and hopes developed that the round of

Chart 8
Implied rate given by December 1998 short sterling(a)



(a) The top and bottom of the line and the spot give the traded high, low and close of day respectively.

Chart 9
UK three-month Libor cash and futures markets

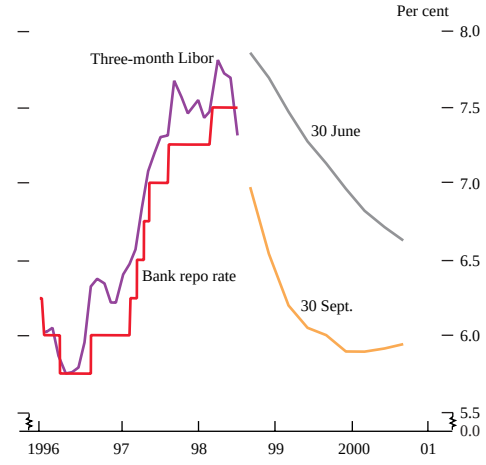
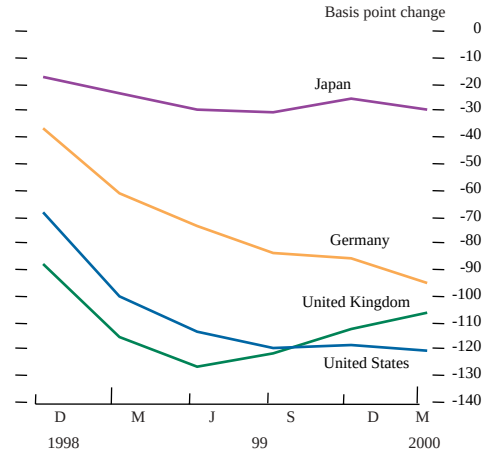


Chart 10
Changes in three-month interest rates implied by futures contracts(a)



(a) Change between end June and end September.

international financial meetings in early October would produce further interest rate cuts.

Following the MPC's statement at its September meeting there were increased market expectations that official UK interest rates had peaked.(1) Implied three-month rates for December fell by 9 basis points on the day, as measured by short sterling futures. The markets came to expect a larger and more rapid decline in rates than envisaged at the end of the second quarter, as Chart 9 shows.

In late September, the US Federal Reserve reduced the target fed funds rate, helping to convince UK markets that the MPC would act sooner rather than later, and implied interest rates in all the major industrialised economies fell. Against this background, the Bundesbank indicated that German interest rates would remain unchanged. Implied rates for the major industrialised nations fell significantly in the quarter as a whole (see Chart 10).

Long-term interest rates

Long-dated yields in the major international government bond markets fell sharply during the quarter (see Chart 11). Yields were little changed during July, but fell in the following two months, to reach lows at the end of the quarter. For the United States, Germany, Japan, and the United Kingdom, nominal ten-year yields fell by between $^{3}/_{4}$ and 1 percentage point during the quarter.

Long-term yields on government bonds were influenced by much the same factors as short rates. The credit quality and relative liquidity of government debt was seen as attractive, and market participants also expected slower growth and lower inflationary pressures. Technical factors further underpinned government bond markets, after the announcement that a consortium of banks would support Long Term Capital Management (LTCM), with others purchasing bonds in which LTCM was believed to be 'short'.

International yield curves changed shape in the quarter, reflecting the changed outlook for monetary policy. The United States began the third quarter with a flat yield curve,(2) which turned mildly upward-sloping as short-dated yields fell most, reflecting the market view that official rates would be lowered significantly. Although inverted, the yield curve in the United Kingdom behaved in a similar way, flattening slightly as the fall in short-dated yields outpaced that of long-dated bonds, on the market view that monetary policy would be progressively eased (see Chart 12). In contrast to this, ten-year yields in Germany and Japan fell by more in absolute terms than two-year yields, as it was thought that the scope for lower official interest rates in each of these economies was limited. The shortage of deliverable ten-year Bunds in the September 1998 futures contract relative to open interest helped to drive long-dated yields lower. For some time in Germany, increasing use of Bund futures to hedge positions in government bonds of the other 'euro-in' countries was noted in the market.

For ERM countries, some limited signs of strain emerged at the end of the third quarter. Ten-year government spreads of 'euro-ins' versus Germany widened, but by limited amounts compared with

(1) See the November *Inflation Report* for details.
(2) Defined as the ten-year yield less the two-year yield.

Chart 11
International ten-year yields

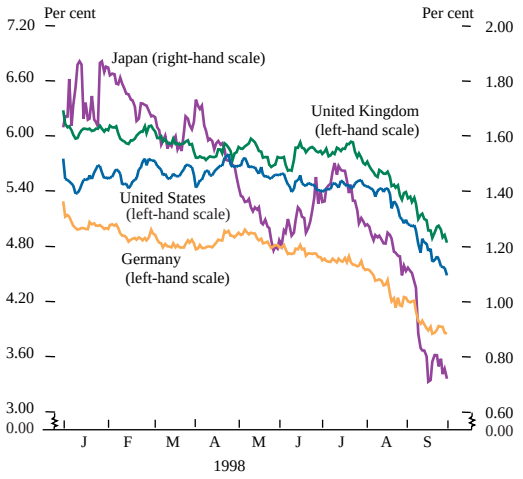
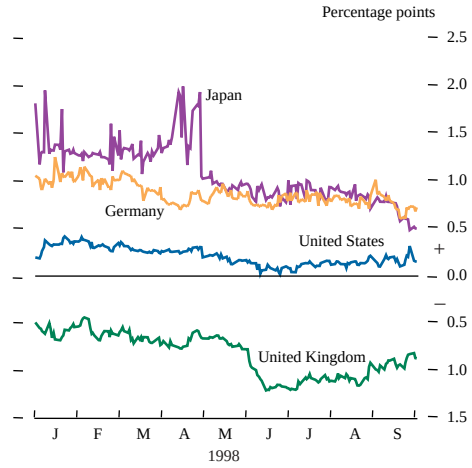


Chart 12
International bond yield gaps(a)



(a) The yield gap is defined as the spread between ten-year and two-year government bonds.

Table C
Official transactions in gilt-edged stocks

£ billions: *not seasonally adjusted*

	1998/99	1998		
	Apr.–June	July	Aug.	Sept.
Gross official sales (+) (a)	3.8	2.4	0.2	0.0
Redemptions and net official purchases of stock within a year of maturity (-)	-1.8	0.0	0.0	-0.8
Net official sales (b)	1.9	2.4	0.1	-0.8
of which net purchases by:				
Banks (b)	1.6	0.1	0.7	2.4
Building societies (b)	-0.1	0.0	-0.1	0.0
M4 Private sector (b)	-3.4	1.2	-1.1	-1.7
Overseas sector	2.9	0.9	0.6	-1.4
LAs & PCs (c)	0.9	0.1	0.0	0.0

(a) Gross official sales of gilt-edged stocks are defined as official sales of stock with more than one year to maturity, net of official purchases of stock with more than one year to maturity, apart from transactions under purchase and resale agreements.
(b) Excluding transactions under purchase and resale agreements.
(c) Local Authorities and Public Corporations.

the non-EMU Scandinavian markets (see Table B). The 1 January 1999 launch date for the euro, when switching among the eleven government bond markets in the euro area will hold no foreign exchange investment risk, helped to prevent further widening of spreads.

Gilt-edged market

Gilt yields at all maturities fell in the third quarter. By the end of the quarter, yields were around 1 percentage point lower, with longer-dated gilt yields approaching their lowest levels since the late 1950s.

In the three-month period the absolute fall in gilt yields was generally larger in the United Kingdom than in other G7 government bond markets. Gilt yields fell more than German Bunds and Japanese government bond yields. This was especially true at the short end of the market, and largely reflected the markets' assessment of the relative scope for monetary easing in the G7. But in the liquid five and ten-year areas, US Treasury yields fell by slightly more than UK yields.

The fall in gilt yields gathered momentum as the quarter progressed and as the perception grew that the next move in the repo rate would be downwards. The belief that monetary policy would soon be eased in the world's largest economies also supported gilts. This, together with 'safe-haven' flows, stimulated a strong gilt market rally. Gilt yields tended to fall when equity prices were declining (see Chart 13). Broadly, the change in the market view on monetary policy had its strongest influence at the short end, and this reduced the degree of inversion.

On 29 July, the Debt Management Office (DMO) auctioned £2.5 billion of 5¾% Treasury Stock 2009, with the expectation that this would develop into the ten-year benchmark for 1999. Some £2.9 billion nominal of 11¾% Treasury Stock 2003–07 was converted into £3.4 billion of 6½% Treasury Stock 2003 on 22 July. The aim was three fold: to build up the pool of strippable stock; to enhance liquidity in the five-year benchmark; and to eliminate a smaller, less liquid stock. On 7 August, the DMO tapped £150 million of 4⅜% Index-linked 2004. Excluding the July conversion, a total of £2.65 billion was issued during Q3, down from £3.45 billion in Q2. This relatively low issuance reflected the Government's lower need for funds this fiscal year, given the Central Government Net Cash Requirement of £3.5 billion, as published in the June *Economic and Financial Strategy Report*. Early in the quarter, there was some market concern about gilt supply, following the publication of a larger-than-expected public sector net cash requirement for June. The Government's Comprehensive Spending Review, completed in July, also raised the possibility, in the markets' perception, that borrowing could be higher in the medium term. However, the Government's financial position in the current year subsequently improved further.

A number of changes to gilt market trading conventions have taken place this year.(1) All were favoured by the majority of respondents

(1) For further information on these changes, see the March 1998 joint paper issued by the Bank and HM Treasury entitled 'Changes to Gilt Market Trading Conventions'. Copies are available from the Bank or the DMO.

Table D
Gilt issuance

Auctions

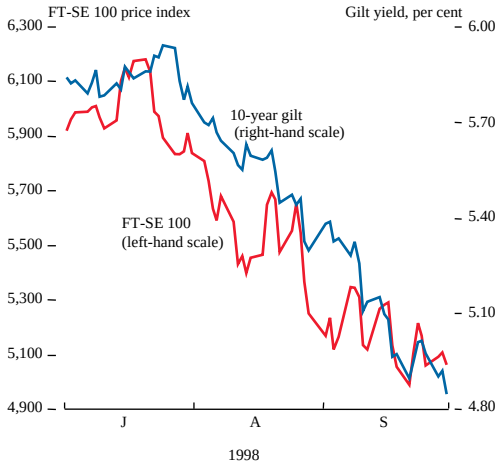
Date	Stock	Amount issued (£ millions)	Cover	Tail (basis points)	Yield at lowest accepted price
29.7.98	5¾% Treasury Stock 2009	2,500	2.93	1	5.73%

Taps

Date	Stock	Amount issued (£ millions)	Issue price	Price at exhaustion	Yield at exhaustion
7.8.98	4⅜% Index-linked 2004	150	128.3125	128.3125	2.91%

Note: Real yields are calculated using a 3% inflation assumption.

Chart 13
FT-SE 100 index and ten-year gilt yield(a)



(a) The yield of the 7¼% Treasury Stock 2007 has been used as the ten-year yield.

Chart 14
Yield spread between 8% Treasury Stock 2013 and 2½% Index-linked 2013

to a consultation on gilt market conventions last year. The implementation dates for the changes were announced in February and March: 31 July for the abolition of special ex-dividend arrangements, and 1 November for changes to the calculation of accrued interest and decimal pricing for gilts.(1)

Index-linked yields and inflation expectations

Along with other fixed-income government markets, index-linked gilt yields fell in the third quarter, but by less than conventional gilt yields. For instance, the yields on 8% Treasury Stock 2013 and 2½% Index-linked 2013 fell by 86 and 19 basis points respectively during the quarter. This lowered the break-even inflation rate, the gap between the two bonds, from 3.01% at the start of the quarter to 2.34% by end September (see Chart 14). Break-even inflation rates fell across the yield curve, continuing the longer-term trend. At the end of September, the implied inflation curve lay below 2.5% (see Chart 15).

The volatile and illiquid conditions toward the end of the quarter mean that the fall in implied inflation expectations should be interpreted with care. During the period of turbulence, investors favoured the liquidity of conventional gilts, so that index-linked bonds tended to underperform conventionals. The prospective start of the index-linked auction programme in the autumn was also said to be affecting the index-linked sector relative to conventionals. The implication is that changes in gilt yields in the third quarter may have overstated the perceived fall in inflation expectations.

The DMO announced that, with effect from 14 September, eight firms had been recognised as specialist index-linked gilt-edged market makers (IG GEMMs). The IG GEMMs have undertaken to provide liquidity in index-linked gilts ('IGs'). GEMMs that are not IG GEMMs will no longer have an obligation to make markets in IGs, and will not enjoy the corresponding facilities. These arrangements have been put in place ahead of the first auction for IGs. Other participants will be able to submit bids in IG auctions through the IG GEMMs. Also with effect from mid September, the DMO published details of its holdings of IGs on its wire service pages. These stocks were available to the IG GEMMs either for switching or outright purchase, as described in the DMO's *Operational Notice* (issued in July 1998). On 30 September, the DMO announced that the first index-linked gilt auction, which had been planned for 28 October, would be delayed to 25 November to

(1) See 'Gilt-edged and sterling money markets: developments in 1997', February 1998 *Quarterly Bulletin*, page 60 for details.

Chart 15
UK implied inflation curve

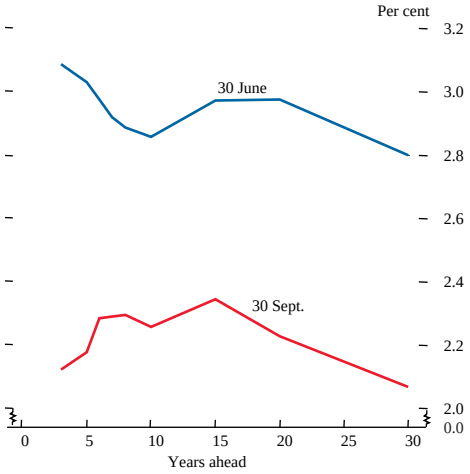


Chart 16
Real yields on index-linked securities

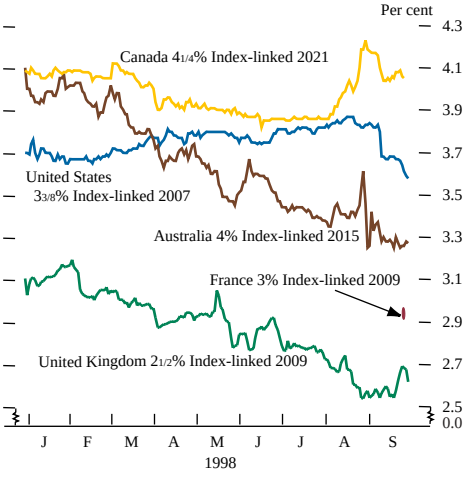
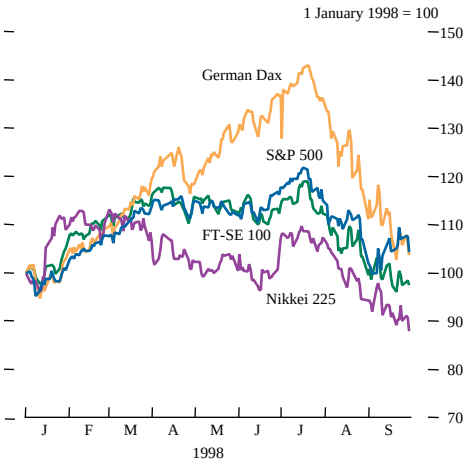


Chart 17
Equity indices (in local currencies)



avoid clashing with the *Pre-Budget Report* subsequently announced for 3 November.

In early September, the French Trésor issued 24 billion francs of its first index-linked debt. The bond has a 3% coupon, matures in 2009, and was initially sold to the market at 2.98%. The issue reportedly sold well, and the yield swiftly fell to 2.95% (see Chart 16). This is closer to real yields prevailing in the UK index-linked market than to those in the US market; however, because of its illiquidity, the French index-linked yield is seen as indicative rather than definitive. Earlier in the quarter, the US Treasury auction of $8 billion of 30-year index-linked bonds went smoothly, at a yield close to 3.7%.

Gilt strips(1)

The total nominal outstanding of potentially strippable stock rose to £95 billion at end July, up from the £89 billion reported in the August *Quarterly Bulletin*. This followed the July conversion and gilt auction. Strippable stock now constitutes about 35% of the total nominal of gilts outstanding. The percentage of stock held in stripped form remained steady in the quarter, at about 3% of outstanding strippable gilts. Weekly strips turnover averaged £153 million in Q3. This is equivalent to about ½% of turnover in the conventional coupon gilts market, and down slightly on the previous quarter.(2)

Interest rate expectations derived from strips fell across all maturities in the third quarter. Because of the low turnover in strips, interest rate expectations derived in this manner may simply reflect what has been happening in the conventional market (as traders tend to price strips from the coupon curve). But evidence from the amount of gilts stripped and reconstituted suggests that activity has been concentrated in particular parts of the curve.

A common trade has been to switch from the 30-year unstripped gilt (6% Treasury Stock 2028) to its principal strip. Those switching from the principal strip were lengthening the duration of its portfolios—increasing the sensitivity of its value to uniform changes in gilt yields—so increasing the potential benefit if gilt yields continue to fall. By end September, the yield on the principal strip had fallen by around 80 basis points since end June.

Equities

After remaining between 5,700 and 6,100 in June, the FT-SE 100 index rose to 6,179 on 20 July, its record end-of-day peak. Between then and close of business on 30 September, it fell by 18% to 5,064.4, broadly in line with other major equity markets (see Chart 17).

This fall in value partly reflected the ‘flight to quality’ out of investments perceived as risky, including equities, and into government bonds. This can be seen by looking at Chart 18, which shows the real yield on a government bond less the yield on equities falling through the third quarter. International factors were

(1) For further background on gilt strips, see pages 15–18, 58–59, and 66–67 of the February 1998 *Quarterly Bulletin*, pages 119–20 of the May 1998 *Quarterly Bulletin*, and page 201 of the August 1998 *Quarterly Bulletin*.
(2) For an analysis of factors contributing to the levels of activity in the strips market, see page 120 of the May 1998 *Quarterly Bulletin*.

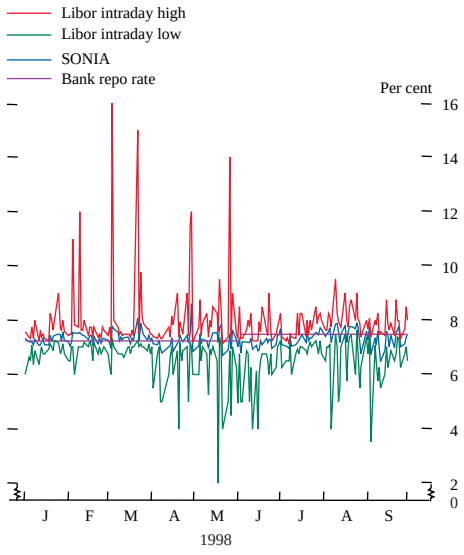
Chart 18
Yield spread: index-linked versus equities (2½% Index-linked 2013 yield less FT-SE All-Share dividend yield)

Table E
Average daily money-market shortages

£ millions

1996	Year	900
1997	Year	1,200
1998	Q1	1,600
	Q2	1,200
	July	800
	August	1,600
	September	1,200

Chart 19
Repo rate, SONIA and intraday Libor



the prime reasons cited by market contacts for UK equity price falls, but expectations of slower domestic growth and lower corporate profitability were also thought to have contributed.

The move in UK equity prices varied across sectors. General industrials and mature industry stocks experienced sharp price falls and, as the quarter progressed, consumer goods and service sector share prices were also adversely affected—indicative of a more broad-based slowdown. Prices in the financial sector fell, reflecting the turbulence in international markets. Utility and resource (water) equity prices held up well in the quarter; these two sectors are often seen as 'defensive' assets when economic conditions deteriorate.

Open market operations and gilt repo

Operations in the sterling money market

The stock of money-market refinancing held at the Bank of England rose from a low of £5.4 billion at the end of June, to nearly £12.5 billion at the end of August.(1) The stock fell slightly during September, to £9.6 billion at the end of the month.(2) The average size of the daily money-market shortage, which had been seasonally low following the coupon payment on strippable gilts due on 7 June, increased during the quarter to around £1.2 billion.

This increased liquidity need was accompanied by firmer money-market conditions during Q3: very short-term market interest rates had been relatively low in June reflecting the low shortages, but rose to more 'normal' levels during the quarter.

There are a number of ways to discern the 'tightness' of money-market conditions. One way is to look at the two-week interbank rate—the maturity of which coincides exactly with the maturity of the Bank's two-week refinancing. Highs and lows of the overnight interbank rate are another indicator, though these are only screen-quoted rates and often little trade takes place at these levels. The Sterling Overnight Index Average (SONIA) includes all trades through brokers weighted by the volume of each trade, and so is a better indicator of overnight money-market conditions.

Chart 19 concentrates on the overnight market. It shows that SONIA tended to be below the Bank's two-week repo rate during most of June and July, but generally traded closer to repo during August and September. The intraday high tended to be lower in Q3 than earlier in the year. This was linked to the introduction of technical changes to the Open Market Operations (OMOs) from 1 June 1998.(3) From that date, all Bank OMO counterparties have had access to overnight repo at 3.30 pm without quota restrictions. Previously, as most of the discount houses moved out of transitional arrangements, the capacity to borrow late in the day from the Bank had dwindled, causing occasional late spikes in the overnight rate. Subsequently, such 'spikes' have disappeared under the new arrangements, with the overnight rate, in effect, 'capped'—only very rarely trading higher than the Bank's late lending rate after the second and final round of two-week OMOs at 2.30 pm.

(1) Excluding foreign exchange swaps and other refinancing.
(2) Including foreign exchange swaps and other refinancing.
(3) The changes were described more fully on page 202 of the August 1998 *Quarterly Bulletin*.

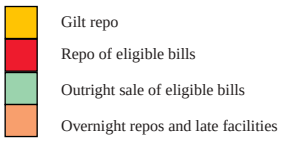
Table F
Influences on the cash position of the money market

£ billions; *not seasonally adjusted*
Increase in bankers' balances (+)

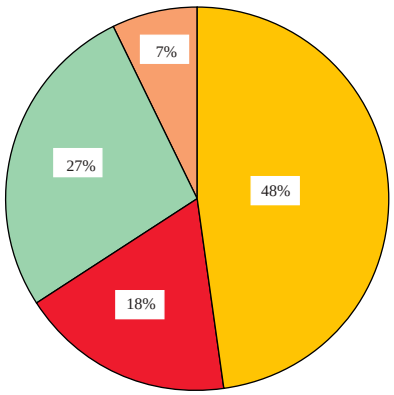
	1998/99	1998		
	Apr.–June	July	Aug.	Sept.
CGNCR (+) (a)	6.6	-5.2	1.8	2.0
Net official sales of gilts (-) (b)	-1.9	-2.4	-0.1	0.8
National Savings (-)	-0.3	-0.2	0.0	-0.1
Currency circulation (-)	-0.6	-2.1	-0.4	2.1
Other	3.2	3.5	-3.9	0.3
Total	**7.0**	**-6.4**	**-2.6**	**5.1**
Outright purchases of Treasury bills and Bank bills	-1.1	0.0	0.1	0.0
Repos of Treasury bills, Bank bills, and British Government stock and non-sterling debt	-4.8	4.4	2.6	-4.0
Late facilities (c)	-0.3	0.0	0.0	0.1
Total refinancing	-6.2	4.4	2.7	-3.9
Foreign exchange swaps	-0.7	2.0	0.0	-1.4
Treasury bills: Market issues and redemptions (d)	0.1	-0.1	0.0	0.0
Total offsetting operations	**-7.0**	**6.5**	**2.7**	**-5.3**
Settlement banks' operational balances at the Bank	0.0	0.1	0.1	-0.2

(a) Central government net cash requirement. Formally known as the CGBR, the CGNCR came into being following the publication of the *Economic and Fiscal Strategy Report* in June. Its definition, however, remains unchanged.
(b) Excluding repurchase transactions with the Bank.
(c) Since 3 March 1997, when the Bank introduced reforms to its daily money-market operations, discount houses and settlement banks have been eligible to apply to use the late facilities.
(d) Issues at weekly tenders plus redemptions in market hands. Excludes repurchase transactions with the Bank (market holdings include Treasury bills sold to the Bank in repurchase transactions) and tap Treasury bills.

Chart 20
OMOs—instrument overview



Percentage shares; July-September 1998



The share of different instruments in the Bank's refinancing during Q3 is shown in Chart 20. There was little change in the relative shares of different instruments, with gilt repo accounting for about one half of the OMOs, and repo of eligible bills about 18%.

The three-month Treasury bill tender remained at £100 million per week during the quarter. The pattern of the stock of refinancing has meant that there has been no need to alter the bill tender for the past year. The low supply of Treasury bills relative to demand led to cover averaging nearly seven times the amount of bills on offer during the quarter.

From 29 January 1998, the Bank introduced foreign exchange swaps as an additional tool through which it could supply liquidity to the sterling money market. Because the money-market shortages were small, there were no foreign exchange swaps outstanding as part of the Bank's money-market operations at the end of June. But as the market's liquidity needs increased during the third quarter, the Bank supplemented its regular OMOs with foreign exchange swaps: £0.6 billion of foreign exchange swaps were outstanding at the end of September.

Gilt repo market

Gilt repo and reverse repo outstandings both rose in the quarter to end August, according to the Bank's regular market survey. The value of repo outstandings was £105 billion at end August, compared with £76 billion at end May and £95 billion at end February. Reverse repo value outstanding stood at £92 billion at the end of August, compared with £69 billion at end May. Two particular factors may lie behind these increases:

(i) since gilt repo is, in effect, a loan collateralised by government bonds, it is one of the safest forms of lending. So gilt repo may have become a more popular instrument for lending towards the end of August as investors began to retreat from risk; and

(ii) the Bank's stock of refinancing was slightly higher at the end of August than at the end of May. This may have helped to generate greater repo activity, as counterparties of the Bank sought more gilt collateral from a wider range of market participants and investing institutions.

Market conditions were extremely volatile at the end of the period, and some thought that this would lead to more trading opportunities and a greater volume of business. But this is not supported by the official data. These show that the value of repo turnover in the May-August period fell to £14 billion per day, from £16 billion per day in the previous quarter.

There are signs that the repo market has entered a more mature stage of development, with increasing outstandings at longer maturities. As Table G shows, 11% and 12% of outstanding repo and reverse repo respectively took place in maturities of more than six months in the quarter ending in August. Otherwise, maturity data in the table were broadly similar in May and August, except for a switch in volume between the two shortest-dated periods.

Table G
Maturity breakdown of outstanding repo and reverse repo over time(a)

		Total (per cent)						Total
		On call and next day	2–8 days	9 days to 1 month	1–3 months	3–6 months	Over 6 months	£ billions
Repos								
1996	May	20	34	23	15	7	1	35
	Aug.	19	33	33	11	4	1	57
	Nov.	19	36	22	19	2	2	69
1997	Feb.	20	29	33	15	3	0	71
	May	27	23	27	18	4	1	80
	Aug.	25	21	24	24	4	1	70
	Nov.	22	22	19	22	11	4	72
1998	Feb.	14	23	25	19	11	7	95
	May	20	24	19	19	12	8	76
	Aug.	27	15	17	18	11	11	105
Reverse repos								
1996	May	20	30	20	23	6	2	34
	Aug.	22	29	29	14	5	1	54
	Nov.	21	34	21	20	3	2	60
1997	Feb.	18	32	26	21	3	0	67
	May	23	21	30	20	6	1	71
	Aug.	17	20	26	26	6	1	63
	Nov.	17	25	17	25	11	5	71
1998	Feb.	14	29	23	19	10	5	94
	May	22	28	17	13	12	10	69
	Aug.	28	20	18	15	7	12	92

(a) From the data reported under the voluntary quarterly arrangements.

Chart 21
Swap spreads for two, five, and ten years in sterling

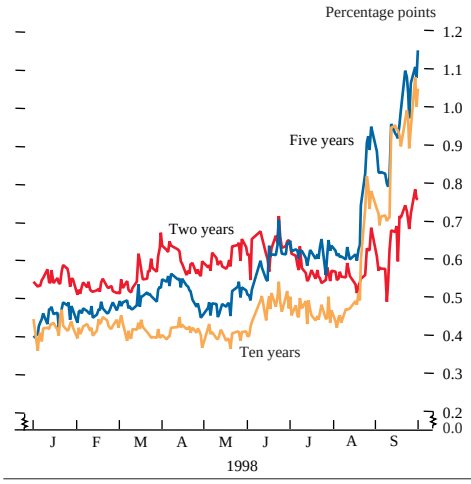
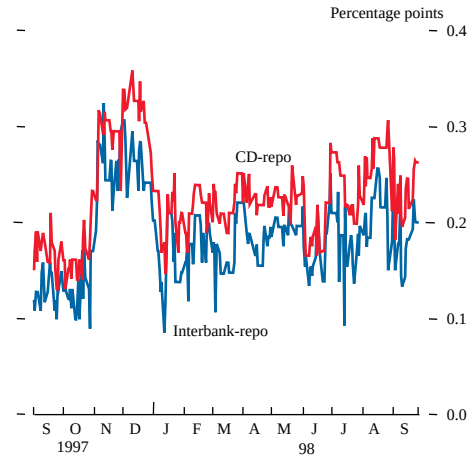


Chart 22
Money-market spreads at three months



Other issues

Credit indicators and spreads

Credit markets were also adversely affected by the turbulence in international markets. The cost of capital to private organisations rose relative to the public sector, and unsecured borrowing rates rose relative to collateralised borrowing.

For example, though nominal yields on corporate bonds fell in the third quarter, borrowing costs relative to high-rated government bonds rose. In the United States, ten-year bond market credit spreads for AA-rated borrowers typically rose from around 30 basis points over US Treasuries to 85 basis points by the end of the quarter. The UK corporate bond market is much smaller than its US counterpart, so liquidity and pricing are more difficult to interpret (particularly at a time of financial stress). But looking at individual UK corporate bond spreads shows that these widened slightly more than in the United States during Q3. This suggests that investors attached a greater risk to holding corporate debt during the quarter.

The fixed-rate leg of a swap at any maturity and the spread over the gilt curve is mainly a measure of Libor bank and counterparty risks. This is because the floating-rate leg of a swap, for which the payments go in the opposite direction, are typically decided at six-month intervals, using six-month Libor.(1) Interest rate swap spreads widened in the quarter (see Chart 21). The swap spread is the difference between the fixed-rate leg of a swap transaction, and the relevant maturity area of the underlying current-coupon gilt curve.

Credit spreads also increased in the sterling money markets. Chart 22 shows a widening of both the CD-repo and interbank-repo spreads in Q3. It is possible that these spreads understate the extent of risk aversion, because lower-quality names may have withdrawn from the market altogether, preferring to reduce their balance sheets, rather than pay high borrowing premia. A similar development was seen in the United States. The gap between three-month Treasury bill yields and same-dated eurodollar deposits (known as the 'Ted spread') widened during the quarter, and to a greater extent than in the United Kingdom (see Chart 23). This suggests that the market perception of US bank credit deteriorated further than in the United Kingdom.

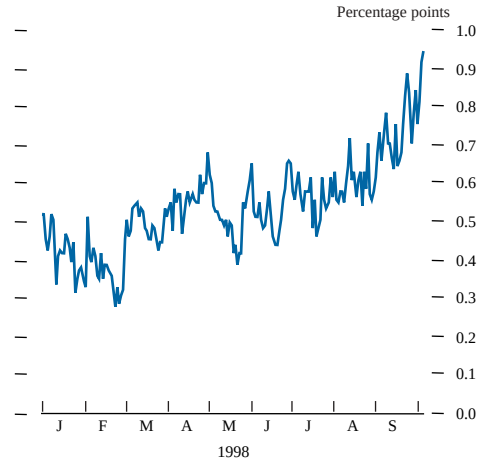
HM Government euro and Ecu issues

On 7 July, the Bank of England published a *UK Government Euro Treasury Bill Information Memorandum*. This changed the denomination of the UK Government Ecu Treasury programme into euro for bills maturing after the start of 1999. The maximum maturity of bills issued is six months, and the timing of the new *Information Memorandum* coincided with the announcement of auction of the first bills maturing in 1999; bills with a maturity date before the end of 1998 will continue to be issued as Ecu bills under the earlier *Ecu Bill Information Memorandum*.

Before the start of 1999, all payments at tender will be made in Ecu at a rate of ECU1:€1. In line with market recommendations,

(1) Note also that both legs are determined with reference to a notional principal amount.

Chart 23
The US Ted spread(a)



(a) Three-month Libor rate less the rate on the three-month Treasury bill.

principal payments in euro will be made on any due date when TARGET is open. The daycount convention for calculating yields on euro bills will be 'actual/360' days, which is the same as for Ecu bills. This is consistent with market standards for the daycount convention for euro money-market instruments.

The United Kingdom held regular monthly tenders of Ecu and euro Treasury bills during the third quarter, comprising ECU 200 million of one-month, ECU 500 million of three-month and €300 million of six-month bills, each month. The tenders continued to be well oversubscribed, with cover averaging 4.3 times of the amount on offer during the third quarter of 1998, and with bids accepted at average yields of 5–14 basis points below the Ecu Libid rate of the appropriate maturity. Secondary market turnover averaged ECU 1.2 billion a month during the quarter, up from ECU 0.9 billion during Q2. There are currently ECU 3.5 billion of UK Government Ecu Treasury bills outstanding.

On 20 July, the Bank reopened the UK Government Euro Treasury Note maturing on 29 January 2001 with a further tender for €500 million, raising the amount outstanding with the public to €1.5 billion. There was strong cover at the auction, of 5.1 times the amount on offer, and accepted bids were in a range of 4.03%–4.06%. The total of notes outstanding with the public under the UK note programme rose from €5.0 billion in the second quarter to €5.5 billion in the third quarter of 1998.

Sterling bond issues

In spite of the turmoil in the markets, sterling bond issuance remained high in the third quarter. Total fixed-rate issuance in the quarter was £6.6 billion, almost 30% above that in 1997 Q3 and slightly above that in 1998 Q2. Short-dated issues amounted to £2.8 billion; issuance of mediums and longs totalled £1.4 billion and £2.5 billion respectively.

As in 1998 Q2, low prospective gilt supply and relatively high sterling spreads have stoked demand for eurosterling issues. The inversion of the UK yield curve encouraged longer-dated issuance, with a number of corporate borrowers tapping this demand, including ABP, Anglian Water, Asda, BAA and GRE. Italy issued a £300 million 30-year sterling bond in July.

Although there were also a few small high-yield debt issues early in the quarter, the growing supply of such issues had begun to result in widening spreads. Further issuance of high-yield bonds was then halted by the subsequent market turmoil.

By the end of July, with the increasing problems in East Asia and Russia, swap and credit spreads generally began to widen to reflect higher risk aversion and switching to high-quality assets, primarily government bonds. As a result, only higher-rated borrowers (supranationals or sovereign-backed agencies) were able to issue at economic levels in August and September. Although increased risk aversion among investors meant that even AAA-rated issues were brought at higher spreads relative to gilts, wide swap rates allowed supranational borrowers to achieve very attractive floating-rate finance. NatWest were able to bring a £300 million 23-year bond in August, but almost all other issues in the two-month period were

for supranationals (EIB, IADB, IBRD) or public bodies (French CADES, Dutch BNG, and US FNMA).

Liquidity in the primary and secondary markets reduced during the quarter. Risk aversion led to widening credit spreads for all issuers, but particularly for lower-rated credits or those associated with East Asian or emerging markets. The lack of liquidity and sharp movements in the swap markets also meant that further potential swap-driven trades were not completed.

Floating-rate note issuance in the quarter totalled £2.6 billion. Although two UK building societies brought issues, just under £1 billion of these were asset-backed deals, which were collateralised via highly-rated special purpose vehicles and so were less affected by higher credit spreads. The largest deal, however, was a £1 billion swap-driven three-year deal for a German government development agency.

The international environment

This article discusses developments[1] *in the international environment since the August 1998* Quarterly Bulletin*:*

- *Events this quarter have been dominated by financial market turbulence, following a debt moratorium in Russia and risks of contagion affecting Latin America. Global equity prices have fallen, and credit spreads on emerging market debt have widened.*

- *Underlying activity in the major industrial economies*[2] *except Japan remained firm in the second quarter. But subsequent falls in both business and consumer confidence pose risks for the deteriorating global outlook and growth in 1999.*

- *The Japanese economy fell further into recession, with its weakest growth since 1955. Confidence indicators remained low, and there were as yet few signs of the fiscal stimulus contributing to activity.*

- *Inflationary pressures were extremely weak in the major industrial economies, largely reflecting falls in commodity prices.*

- *The United States and Japan eased monetary policy in 1998 Q3. The prospective euro area also experienced a monetary easing, as countries with higher official interest rates reduced them. Bond yields fell in the major markets, partly reflecting a flight to quality. The Japanese benchmark bond yield fell to record low levels.*

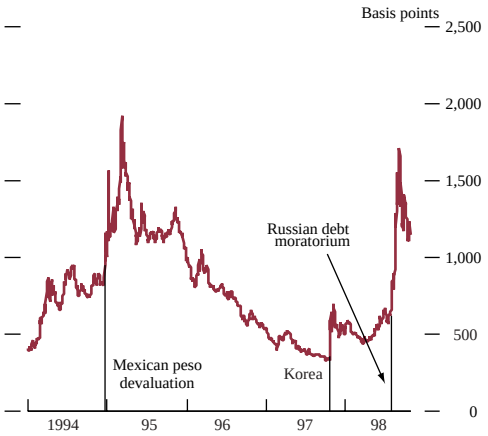
Global financial markets were affected by a series of adverse shocks during the third quarter. These resulted in a reassessment of risk, a loss of confidence in emerging markets, and sizable capital flows out of emerging economies.

In Russia, economic and political crises led the government and central bank to abandon their stable exchange rate policy and allow the rouble to float on 17 August, about one month after receiving approval and partial disbursement of their IMF loan. Shortly afterwards, a moratorium on domestic currency debt was announced. This seems to have increased market participants' perception of the risk of default on emerging market debt, and was reflected in the increase in yields on emerging market debt relative to US government debt.

Spreads on emerging market bonds were also affected by the introduction of capital controls by the Malaysian government on 1 September, as part of a scheme to protect domestic financial markets and stimulate domestic demand, which raised concerns about the convertibility of claims on emerging markets. The loss of confidence in emerging markets spread to Latin America, partly because of market concerns about the fiscal position in Brazil, but

(1) Based on data up to 31 October 1998.
(2) The major six industrial economies comprise the G7 countries minus the United Kingdom, ie the United States, Japan, Germany, France, Italy and Canada.

Chart 1
Emerging market sovereign spreads over US Treasuries



Source: Emerging Market Bond Index, J P Morgan.

also because of the region's dependence on commodity exports; dollar commodity prices have fallen by more than 20% since the start of 1997. Chart 1 shows that the average differential between emerging market government debt and US government debt rose sharply in the wake of these events, close to levels last reached during the Mexican crisis of 1994–95.

The instability in global financial markets has resulted in sizable losses reported by financial institutions on their exposures to emerging markets. The full extent of the financial sector's exposure, including exposure of, and to, hedge funds and exposures from derivatives, is not easy to establish, and constitutes a further source of potential instability in financial markets. As a result of financial instability, and the reduction in financial institutions' appetite for risk, credit conditions in many countries appear to have tightened.

Credit conditions in the United States seem to have been particularly affected. The spread of corporate bond yields over the risk-free rate widened substantially in mid October before falling back; there was also some widening of swap spreads. The Federal Reserve Board's senior loan officer opinion survey on bank lending practices showed that there had been some tightening of credit conditions in September. Banks were more unwilling to lend to large firms than in August, but the lending stance to small firms remained basically unchanged. Banks themselves generally blamed the decision to tighten on a less favourable economic outlook, industry-specific problems and a reduced tolerance for risk.

How has the recent global financial instability affected the major industrialised economies, where, with the notable exception of Japan, growth has been relatively robust since the onset of the Asian crisis last summer?

The effects of global financial instability may be transmitted through a number of channels. These can be separated into direct channels, which are concerned with trade (including trade in services), activity and price effects; and indirect channels, which include systemic concerns and changes in risk premia and capital flows (both portfolio and foreign direct investment flows).

Table A
Exports to emerging markets, end 1997

Percentage of total

	Asia	Russia	Eastern Europe	Latin America
United States	20.8	0.5	0.9	15.5
Japan	28.1	0.3	0.6	2.3
Germany	7.0	2.1	9.7	2.3
France	6.3	1.1	3.4	1.8
Italy	6.6	1.8	7.0	3.3
United Kingdom	7.3	0.8	2.8	1.3
Prospective euro area	6.0	1.6	6.4	2.1

Note: In cases where 1997 Q4 data were not available, 1996 data are given.
Asia: Malaysia, Indonesia, Thailand, South Korea, Philippines, Hong Kong SAR, People's Republic of China and Japan.
Eastern Europe: Russia, Belarus, Georgia, Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania and Croatia.
Latin America: Argentina, Brazil, Chile, Venezuela and Mexico.

Source: IMF *Direction of Trade Statistics*.

As Table A shows, the major industrialised economies export far less to Russia than to Latin America or Asia, so the crisis in Russia will have few direct trade effects (although exports of financial services may be more affected). But 15% of US exports are to Latin America, and eastern Europe is a major export market for Germany. As capital flows to emerging markets decrease, those countries must narrow their trade deficits by exporting more or importing less from the industrialised economies. A reduction in exports to emerging markets from the major industrialised economies is likely to slow their growth next year. Events this quarter will probably put continued downward pressure on commodity prices, further reducing global inflationary pressures. Financial fragility could increase, particularly in the case of the already weakened Japanese banking system, resulting in a reduction of credit availability, increased tax burdens (from bailing out banks) and any broader financial systemic consequences following on from bank failures.

Chart 2
Japan: contributions to quarterly GDP

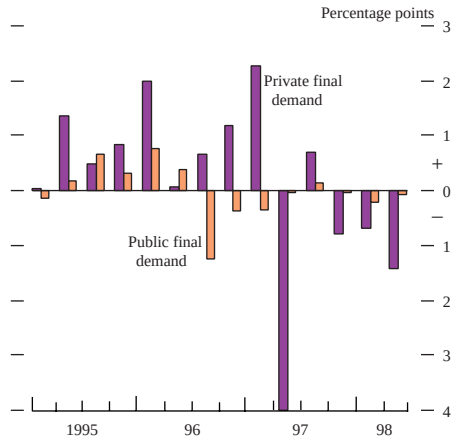
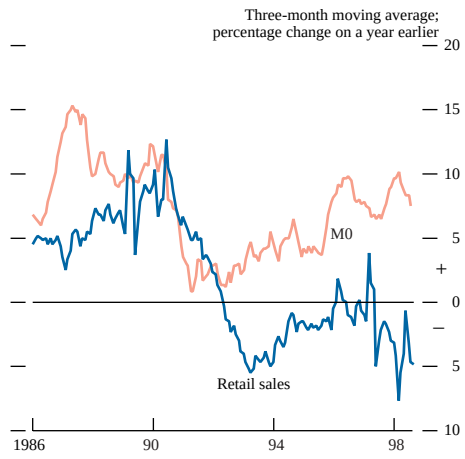
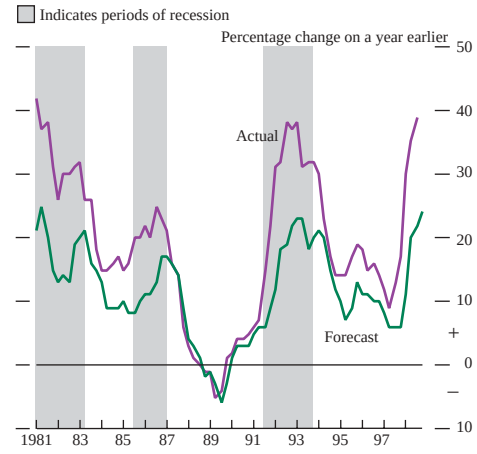


Chart 3
Japanese M0(a) and underlying retail sales



(a) Currency in circulation excluding banks' holdings.

Chart 4
Tankan survey: finished goods stocks—major manufacturers(a)



(a) Balance of manufacturers reporting excess inventories minus those reporting insufficient inventories.

One of the main reasons for the weakness in the world economy this quarter has been the deteriorating position of Japan, the world's second-largest economy.

Japanese GDP fell by 0.8% during the second quarter, its third successive quarterly fall, and Japan's worst growth performance since 1955, when GDP data were first collected. An increase in net trade failed to offset a significant deterioration in domestic demand.

There were few signs that the fiscal stimulus, implemented in May, had begun to contribute to activity. As Chart 2 shows, final public demand made a negative contribution to GDP growth in 1998 Q2, (its third consecutive contraction). The main reason for this appeared to be that local government (which accounts for more than half the spending of April's ¥7.7 trillion fiscal package on either joint projects with central government or local projects) were unwilling or unable to increase public works spending, owing to a deterioration in their own fiscal position. Indeed, the Kanagawa prefectural government announced a fiscal 'emergency' in September. Any increase in local government spending is likely to occur only after their budgets are finalised by end October. It therefore seems unlikely that public spending will have increased significantly in 1998 Q4.

Consumer confidence remained weak. Private consumption fell by 0.8% in the second quarter, more than reversing the 0.3% rise in 1998 Q1. The Nippon Institute 'index of consumer anxiety' reached its highest-ever level in August, with two thirds of respondents fearing unemployment in their family in the coming twelve months; the unemployment rate reached a record high of 4.3% in both August and September, and there were few indications that labour market conditions were improving. Employment continued to fall, owing to increasing bankruptcies and continued restructuring in the manufacturing sector.

Consumption fell during the second quarter even though employees' compensation rose by 0.3%, suggesting that precautionary saving could have risen. Chart 3 shows that the demand for currency in circulation has been growing much faster than nominal retail sales. This partly reflects the lower opportunity cost of holding more cash, given weak inflationary pressures and the low interest rate environment in Japan, but perhaps also greater fears about financial fragility. The passage of legislation to enable the recapitalisation of the banking system may be important in improving consumer confidence in the months ahead.

Weak domestic demand and export markets boosted involuntary stock levels to near-record highs. October's Tankan survey showed further falls in business confidence, with small manufacturers recording record lows. Unwanted inventories rose, though industrial production fell by 0.3% during the third quarter. In addition, the gap between actual and forecast inventory positions remains wide (see Chart 4), suggesting that firms continue to overestimate demand.

Firms have responded to the inventory problem by cutting output (and therefore labour) and by reducing investment. Investment fell by 5.5% in 1998 Q2, following a 5.2% fall in 1998 Q1. Corporate profits continued to fall, reducing the availability of internal funding. The ability of banks to continue lending was hampered by

banks' need to rebuild their balance sheets, under the Prompt Corrective Action supervisory system. Indeed, the Bank of Japan's monetary easing in September seemed to be aimed at providing banks with more funding than they can on-lend.

Activity in the United States remained relatively robust in the second quarter, although there was some moderation in growth, partly due to the General Motors (GM) strike. Early indications suggest that final domestic demand continued to slow in the third quarter. Forward-looking indicators suggest that a slowdown in growth is possible, particularly if consumer spending falls as a result of equity market turbulence.

US GDP rose by 0.5% in the second quarter (see Table B), compared with 1.4% growth in the first. This reflected, in particular, a marked slowdown in the growth of inventories, in part due to the effects of the GM strike, estimated by the Bureau of Economic Analysis to have reduced GDP growth by about 0.2 percentage points. The advance GDP estimate suggests that there was some bounceback in the third quarter as GDP grew 0.8%, but that reflected stronger-than-expected net trade and stockbuilding. Final domestic demand growth halved to 0.8% from 1.6% in the second quarter.

Net trade appears to have been extremely volatile. Slower GDP growth in the second quarter was also the result of a fall in net exports, as final domestic demand growth was more robust, though slower than in 1998 Q1. Meanwhile, continued dollar strength and the weakness of Asian markets restricted exports. In July and August, export volumes fell for the first time in five years, by an average of 2.3% from a year earlier. But the advance estimate suggested that export volumes growth were not as weak as in Q2, with volumes expanding again in September.

Business investment growth in the United States remained rapid, though slowed both in the second and third quarter, and the outlook for investment may be muted. Capacity utilisation remains on a falling trend. And in the four months to September (which should smooth out strike effects), industrial production fell by only 0.1%, or by 0.4% excluding automobiles. Business sentiment weakened, with the National Association of Purchasing Managers (NAPM) survey of business confidence falling below levels that would normally be associated with rising output (see Chart 5). Profits have continued to fall, with companies revising down expected earnings in the wake of lower world demand. And the fall in equity prices and increase in corporate bond yields are likely to have increased the corporate cost of capital.

Consumption remained strong, rising by 1.5% in the second quarter, and contributing a full percentage point to GDP growth. As in the first quarter, consumption was boosted by steady real income growth, as employment conditions remained buoyant, and by continued increases in equity prices.

But even though consumption was strong in the third quarter, growing by 1%, it is slowing. Consumer confidence fell in each of the four months following its June peak, albeit from a high level. The falls particularly reflect concerns about future business conditions, employment and income. The growth of non-farm payrolls slowed to 0.5% in the third quarter, a rate last seen in 1996.

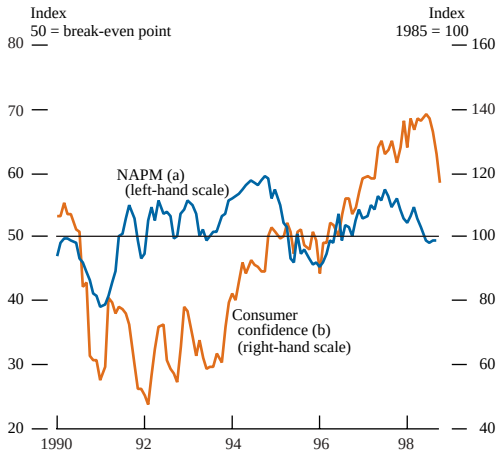
Table B
International GDP growth

Percentage changes on previous period

	1997	1998	
	Year	Q1	Q2
France	2.3	0.6	0.7
Germany	2.3	1.4	0.1
Italy	1.5	-0.1	0.4
Prospective euro area (a)	1.6	0.8	0.5
United States	3.8	1.4	0.5
Japan	0.8	-1.3	-0.8
of which, domestic demand contributed (percentage points)			
France	0.8	1.3	0.9
Germany	1.5	1.7	0.1
Italy	2.4	0.8	0.2
Prospective euro area (a)	1.9	1.4	0.3
United States	4.3	2.0	1.1
Japan	-0.7	-0.7	-1.4

(a) The prospective euro area is approximated by GDP-weighted growth for France, Germany, Italy, the Netherlands, Spain, Finland and Belgium, which accounted for 94% of the prospective euro area's GDP.

Chart 5
US consumer and business sentiment



(a) Source: National Association of Purchasing Managers.
(b) Source: The Conference Board.

Chart 6
US household borrowing and consumption

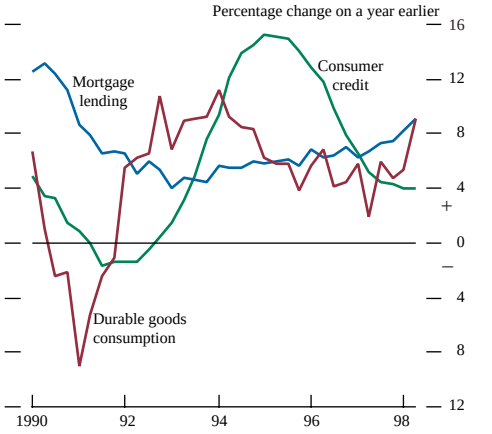
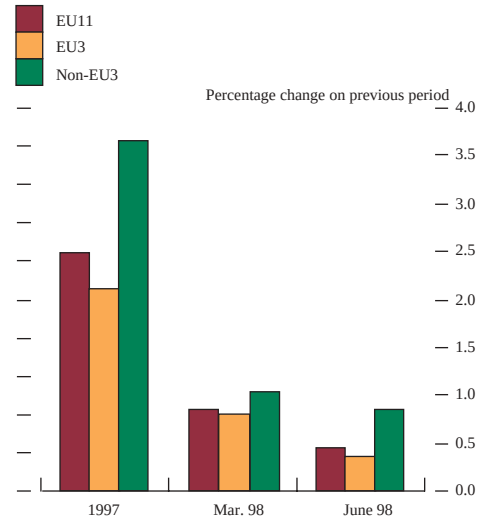


Chart 7
Euro-area GDP growth



Note: Prospective euro-area growth is approximated by GDP-weighted growth for the following countries, which account for 94% of the prospective euro area's GDP:
Non-EU3 includes Spain, Belgium, the Netherlands and Finland.
EU3 comprises Germany, France and Italy.
EU11 includes all of the above.

Chart 8
EU3 industrial production and retail sales

Continued turbulence in equity markets may also have adversely affected confidence. Perhaps owing to past increases in wealth, consumption growth has exceeded income growth in recent quarters, with the US household saving ratio falling to a level of only 0.4% in 1998 Q2. Consumption of consumer durables has typically been financed by credit card borrowing. But in recent quarters, the rise in consumption has been associated with an increase in re-mortgaging, while consumer credit growth has slowed (see Chart 6). The fall in US long-term bond yields has lowered the rates on new mortgages, and has also allowed some households to reduce their mortgage payments by re-mortgaging at lower rates. However, the continued ability of consumers to do this is limited by the scope for bond yields to fall below what are already historically low levels. Indeed, there was some rebound in mortgage rates during October. And if wealth effects are important in determining the readiness of consumers to borrow, concerns about financial markets would also limit durables' consumption growth.

Growth in the prospective euro area (EU11) slowed in the second quarter, but this largely reflected special factors in both Germany and Italy, which should have unwound during the third quarter. Growth in smaller European economies remains strong. But slower stockbuilding and falls in business confidence might reduce growth in the months ahead.

GDP in the EU11 rose by 0.5% in the second quarter, down from 0.8% in 1998 Q1.(1) However, this slowdown largely reflects special factors in Germany and Italy. German consumption and investment had both increased strongly during the first quarter, ahead of a VAT increase, so slower growth in 1998 Q2 was expected. In Italy, working-day effects reduced GDP growth in 1998 H1. Both of these factors should have unwound during the third quarter, leading to some rebound in growth, but weakening business surveys suggest that any bounceback might be muted.

Underlying growth in the prospective euro area as a whole remained strong (see Chart 7), with a bigger contribution from domestic demand in 1998. But there was a build-up of inventories in Germany and Italy over the second quarter. Both IFO and Confindustria surveys suggest that stockbuilding is unlikely to have continued to rise at the same rate. Any deceleration in stockbuilding would detract from GDP growth from 1998 Q4 onwards.

Industrial production growth slowed in 1998 (see Chart 8). That largely reflected slowdowns in Italy and Germany over the second quarter. More recently, weaker external demand in the euro area as a whole, and subdued consumption growth in Italy and Germany, have also depressed EU industrial production. In contrast, French retail sales continued to grow strongly, which helped to keep stocks at desired levels. Average French household consumption in July and August was around 3% higher than its second-quarter average.

The outlook for industrial production has weakened following problems in Russia; industrial confidence has fallen in Germany,

(1) This measure of euro-area growth is a GDP-weighted average derived from the national accounts of seven countries (see Chart 7), and is therefore partly working-day adjusted. By contrast, European GDP grew by 0.1% in the second quarter using Eurostat's harmonised GDP data, which include all eleven prospective euro-area countries and are also fully working-day adjusted.

Chart 9
EU3 employment growth

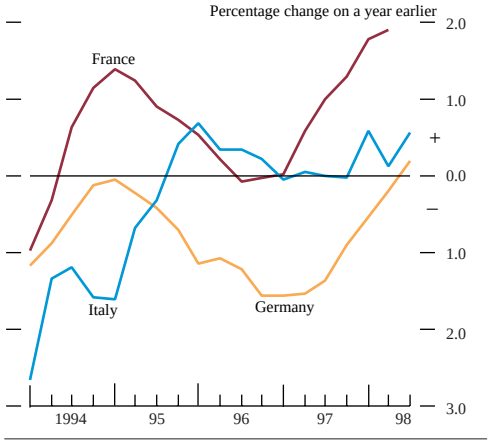


Chart 10
German government employment programmes

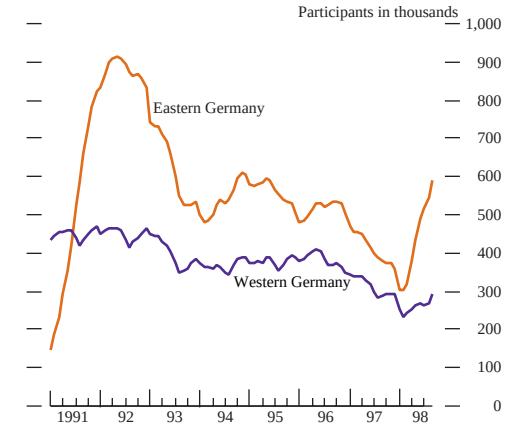
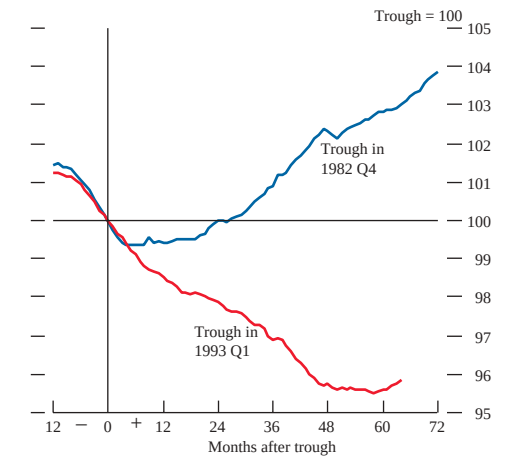


Chart 11
Western German employment after recoveries



France and Italy, albeit from high levels. The German IFO index fell to 94.0 in September, from 98.5 in July. The sub-index of business expectations (which accounts for around 50% of the total index, with the sub-index of the current business situation accounting for the other 50%) fell more rapidly than during the Asian crisis. The French INSEE survey also reflected declines in confidence, with the balance of firms expecting output to increase in the coming months falling to 6 in October, from a peak of 35 in July.

Euro-area consumer confidence, as measured by the European Commission, fell slightly in September, but remained at near-record highs. This reflected employment growth across Europe (see Chart 9), particularly in France, where consumer confidence is closely correlated with unemployment expectations. Consumer confidence in continental Europe is less likely to be depressed by financial market turbulence than in the United States, as a smaller proportion of European household wealth is held in equities. Only Italy and the Netherlands experienced significant falls in consumer confidence, based on a perceived deterioration in personal finances.

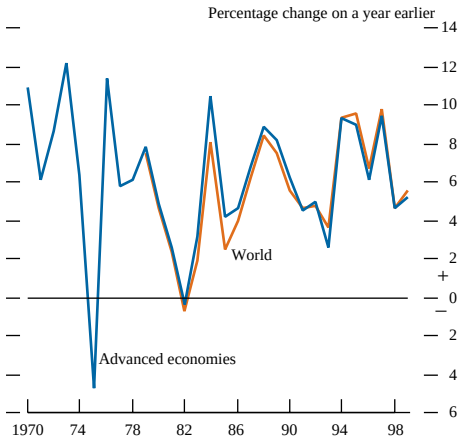
The outlook for consumption in Europe remains dependent on continued employment growth. The French economy remained in a cyclical upswing, which helped to generate a broad-based increase in employment. By contrast, the reduction in German unemployment so far in 1998 has partly reflected public employment schemes.

As Chart 10 shows, German government employment programmes were reduced in 1997, reflecting public spending constraints imposed by the Maastricht deficit criterion. But public employment schemes have increased strongly in 1998, particularly in eastern Germany, where various employment promotion and vocational training schemes increased employment by around 232,000 between December 1997 and September 1998. Adjusting unemployment data for those participating in schemes, underlying unemployment in Germany fell by only 130,000 between December 1997 and September 1998, rather than the 364,000 decline shown by the unadjusted unemployment data.

Employment growth in Germany has lagged the recovery in output. Chart 11 shows that whereas employment grew rapidly after the 1982 recession, it continued to fall for a significant period following the 1993 recession. The increase in lags between output and employment growth perhaps reflects higher labour costs. Unit labour costs increased annually by an average of 2.9% between 1980 to 1989. The annual growth rate then rose to 4.5% from 1990 to 1995, before unit labour costs peaked in 1996. Although they have subsequently fallen, German labour costs remain high compared with other euro-area countries, making companies more likely to employ capital rather than labour when expanding capacity.

German vacancies increased by 30.6% in the third quarter, relative to a year earlier, suggesting that employment growth may pick up. Combined with tax cuts, employment growth should help aggregate disposable income to increase more strongly in 1999 than in recent years. But the German economy, and especially business sentiment, remains vulnerable to external shocks, suggesting that a continued recovery in the labour market is by no means assured.

Chart 12
World trade growth (volume of goods and services)



Source: IMF *World Economic Outlook*, October 1998.

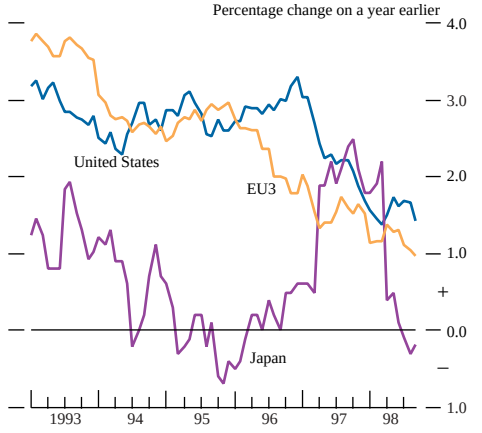
Table C
External forecasts for GDP growth

Per cent

	IMF (a)		Consensus economics (b)		*The Economist* poll of forecasters (c)	
	1998	1999	1998	1999	1998	1999
United States	3.5	2.0	3.4	2.0	3.4	1.9
Japan	-2.5	0.5	-2.5	-0.2	-2.3	-0.2
Germany	2.6	2.5	2.6	2.3	2.6	2.2
France	3.1	2.8	3.0	2.4	2.9	2.4
Italy	2.1	2.5	1.9	2.2	1.8	2.3
United Kingdom	2.3	1.2	2.5	1.0	2.3	0.8
Canada	3.0	2.5	3.0	2.1	3.0	2.1

(a) *World Economic Outlook* (October 1998).
(b) *Consensus Forecasts* (October 1998).
(c) *The Economist* (31 October 1998).

Chart 13
International CPI inflation



Although activity in the major industrial economies remained relatively robust during the second quarter, financial turbulence and resultant falls in business and consumer confidence have increased concerns about the immediate outlook.

Reflecting the deterioration in the international outlook, the IMF revised down its projections for world trade and world GDP growth in its most recent *World Economic Outlook*. World trade is expected to grow by 3.7% in 1998, a sharp slowdown compared with 1997, before rising to 4.6% in 1999 (see Chart 12). As Table C shows, the major six industrial economies are now expected to grow at or below trend in 1998 and 1999. The IMF also notes that, 'the risks to this projection, however, are predominantly on the downside ...; indeed, a significantly worse outcome is distinctly possible ...'. In aggregate, the IMF expects the seven major industrial economies to grow by 2.0% in 1998 and 1.9% in 1999 (down from forecasts of 2.3% growth and 2.2% growth in May 1998). After the United Kingdom (-0.9 percentage points), Japanese growth prospects for 1999 received the largest revision, a reduction of 0.8 percentage points from May.

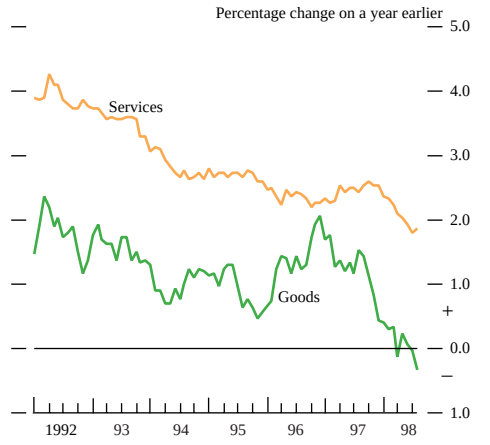
Headline consumer price inflation continued to fall across the major six overseas economies in the third quarter, as commodity price deflation persisted. Food price inflation remained reasonably strong, largely reflecting adverse weather conditions. Both goods and services price inflation continued to decline, although the gap between them widened.

Consumer prices in the six major industrial economies were on average 1% higher in August than a year earlier, down from the average 1.3% annual growth rate in the first half of the year. Weak commodity prices continued to restrain inflation, with oil prices remaining around record lows. However, adverse weather conditions increased food price inflation. Annual inflation within the EU3 (Germany, France and Italy) declined further, and was just above 1% (see Chart 13), somewhat lower than annual rates of harmonised inflation for the prospective euro area as a whole (around 1.2%). The difference in inflation rates reflects much stronger activity in some of the smaller EU countries.

Goods prices in the major industrial countries, excluding Italy (and the United Kingdom), were lower in the twelve months to August (see Chart 14), while services prices rose by around 2%. The wedge between goods and services prices has widened. That might partly reflect lower commodity and hence input prices, as well as currency appreciation feeding through into goods prices. As non-tradables, services prices are far less influenced by international factors. Further, wages are a more significant cost for services industries, and there are few signs that wage growth has slowed. US non-farm average hourly earnings rose by 4.1% in 1998 Q3. Wage growth also picked up in both Germany and France. Wage growth appears limited only in Japan, where bonus and overtime payments, which account for a significant portion of total income, have fallen.

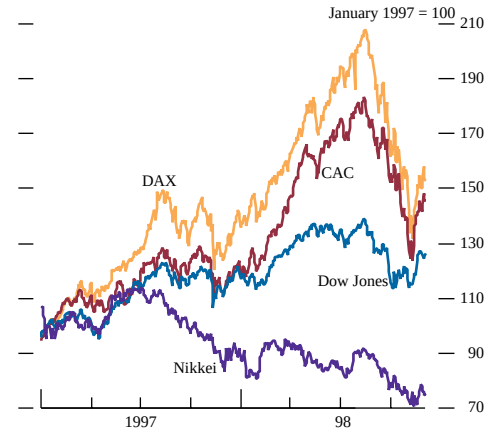
There is deflation in Japan, where both consumer and producer prices were lower in September than a year ago. Even measured consumer prices, which overstate inflation, fell by 0.2% in the year to September. Domestic wholesale prices were also weak, falling by 2%. Yen weakness restrained deflationary pressures by lifting

Chart 14
M5 goods and services inflation(a)



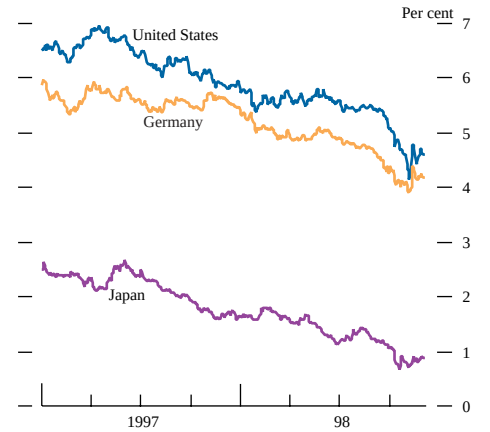
(a) GDP-weighted average of the United States, Japan, Germany, France and Canada.

Chart 15
Equity prices(a)



(a) In local currencies.

Chart 16
G3 ten-year bond yields



import prices and limiting the effect of falling commodity prices; and broad money growth was positive in the third quarter, suggesting that a deflationary spiral might not fully emerge.

Currency, bond and equity prices were more volatile.(1) *Equity prices in the United States and major European markets fell significantly from their July peaks, before rebounding following interest rate cuts in industrialised economies. The Japanese market continued on its downward trend, begun in 1991.*

Equity prices (in local currency terms) in the major European markets fell by more than 30% between the 17 July peak and early October, but then recovered somewhat, ending around 20% lower by end October. In contrast, the Dow Jones Industrial Average, which appeared to be losing momentum earlier in the year, fell by more than 18% from July to its September low, but was only 10% lower by end October (see Chart 15). The bulk of the equity price fall occurred in response to the Russian crisis and fears of financial market contagion. But with the exception of the Nikkei (which fell by 33%), equity prices in major markets were still above their end-1997 levels. So to date, only the rise in equity prices in the first half of 1998 has unwound. The limited nature of the fall in equities prices suggests that, with the exception of Japan, the decline in household wealth from equity price falls should not be a major constraint on consumption.

Any reduction in equity prices normally reflects a combination of three factors: a downward revision to expected corporate earnings; an increase in the equity risk premium; or an increase in the risk-free rate. The equity risk premium, the expected return on equities over and above the risk-free rate, is usually thought of as being driven by two factors—risk aversion and uncertainty. It is difficult to disentangle exactly the relative importance of each, but implied volatility derived from S&P 500 index option prices for March 1999 increased by around one third between 14 August and early October, suggesting that uncertainty had increased. Since then implied volatility has reduced somewhat.

A further explanation of recent financial asset price movements was changes in market liquidity. Chart 16 shows that yields on all G3 ten-year bonds fell in August, perhaps partly reflecting expectations of looser monetary policy in response to a slowdown in activity. But yields on the most liquid of these, US government bonds, fell by more. Further, as Alan Greenspan, chairman of the US Federal Reserve, pointed out in a speech to the National Association for Business Economics on 7 October, there was a differentiation in yields between US Treasury bonds with different liquidity. Normally, 'on the run' US Treasury issues (ie those that have just been issued) yield between 3 to 5 basis points lower than 'off the run' (immediately preceding) issues, even though the two bonds are of similar maturity. During October, that spread widened substantially, suggesting that the liquidity premium had increased. The US corporate bond market, which is more illiquid than the government bond market, experienced an even larger increase in yield spreads.

Possibly reflecting concerns about the emergence of a deflationary spiral and increasing pessimism on the economic outlook, the

(1) See 'Markets and operations', pages 301–13.

benchmark Japanese government bond yield fell to a series of record lows, closing at 0.715% on 2 October before recovering.

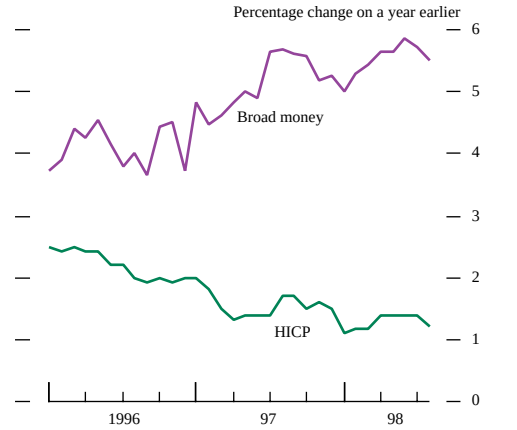
The annual rate of broad money growth remained robust in the major industrial economies.(1) *Narrow money growth slowed between June and August in all major industrial economies, with the exception of Japan.*

Real annual broad money growth reached its highest level in the 1990s at 4.4% in June. Broad money velocity (and, to a lesser extent, narrow money velocity) has, however, fallen over the past year.

Narrow money growth fell in all major industrial economies except Japan between June and August. As discussed earlier, high rates of Japanese narrow money growth (around 8% relative to a year earlier) are consistent with an increased preference for cash. This reflects greater financial fragility and the low opportunity cost of holding cash, not strong nominal demand. Broad money growth remained more subdued.

The Governing Council of the European Central Bank (ECB) announced its future monetary policy strategy on 13 October. The ECB has defined price stability quantitatively as 'a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%'. Price stability is to be maintained over the medium term. The ECB assigned a prominent role to broad monetary aggregates, in parallel with a 'broadly based assessment of future price developments'.

Chart 17
Euro area HICP(a) and broad money growth(b)



(a) Source: Eurostat.
(b) Source: Bank estimate.

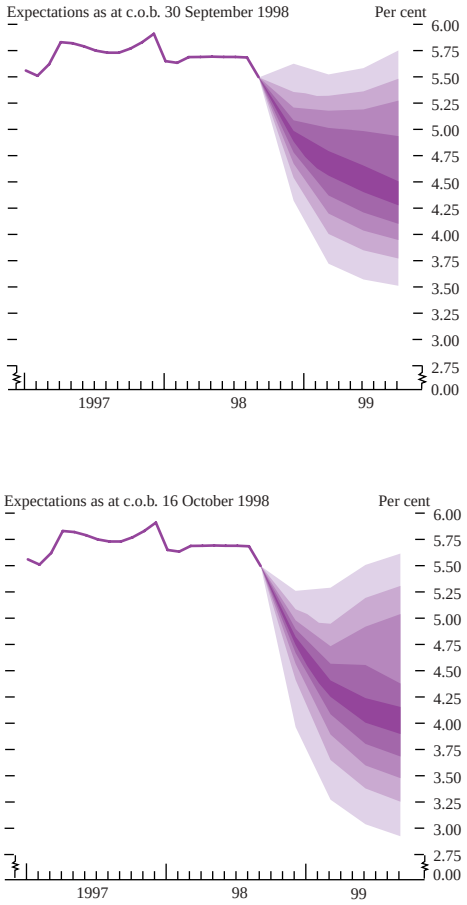
Chart 17 suggests that both inflation and monetary data appear benign. HICP annual growth in the prospective euro area as a whole remained at 1.2%, well within the target ranges. Annual broad money growth picked up to 5.6% in the second quarter, and continued to grow at that rate in the first two months of 1998 Q3. This is above the average 5.1% growth rate in 1997, but with activity slowing in the major European countries, there are few signs that the pick-up in money growth presages increasing inflationary pressures. The benign inflationary outlook explains why short-term interest rates are now expected to converge on current German official interest rates of about 3.3%, rather than the market expectation of 3.5% implied by three-month euromark futures during August. The reduction in official interest rates as the rest of Europe converges on 3.3% rather than 3.5% would imply an effective easing of around 50 basis points for the euro area as a whole.

US, Canadian and Japanese monetary authorities eased policy in September. Within Europe, the picture was more mixed. Some prospective euro-area monetary authorities also eased monetary policy, while some EU members not participating in the first wave of monetary union raised official interest rates in order to ease market pressure on their currencies.

The Bank of Japan (BoJ) guided the overnight call rate down by 25 basis points, to 0.25% on 9 September. While the official discount rate remained unchanged (giving the BoJ scope for a further interest rate cut if necessary), the reduction in the call rate

(1) As measured by the GDP-weighted average of broad money growth in the major industrial economies.

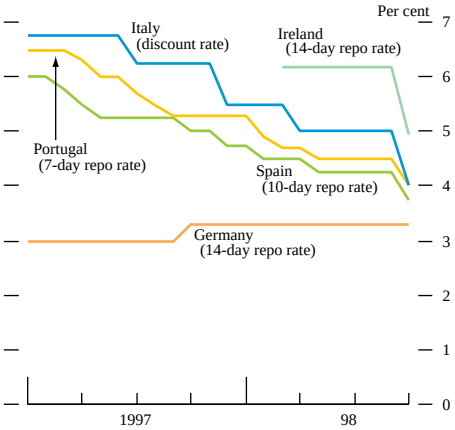
Chart 18
Implied distribution for three-month eurodollar interest rates



Source: CME and Bank of England.

The chart depicts the probability distribution for short-term interest rates, and is rather like a contour map. So at any given point, the depth of shading represents the height of the probability density function implied by the markets over a range of outcomes for short-term interest rates. The markets judge that there is a 10% chance of interest rates being within the darkest, central band at any date. Each successive pair of bands covers a further 20% of the probability distribution until 90% of the distribution is covered. The bands widen as the time horizon is extended, indicating increased uncertainty about interest rate outcomes.

Chart 19
European official interest rates



should reduce banks' funding costs and so help to offset a credit crunch.

The US Federal Reserve Bank lowered the federal funds target rate by 25 basis points to 5.25% on 29 September, and by a further 25 basis points to 5% on 15 October. The US rate cuts reflected increasing concerns about the global economy and its impact on US credit conditions. Both reductions were quickly followed by the Bank of Canada, which reduced its bank rate by 50 basis points, to 5.25%. Those rate cuts partly reversed the 100 basis point tightening in August (which had been necessary to protect the Canadian dollar from market pressure).

Chart 18 shows how the implied risk neutral probability distribution of short-term interest rate expectations, derived from options, in the United States changed, following the second reduction in official interest rates. Previously, the deepest purple band, which shows the outcome considered most likely by financial markets, suggested a continued monetary easing by the Federal Reserve Board. The mean expectation of three-month interest rates was for a 40 basis point fall by December 1998 and a further 50 basis point fall by September 1999. However, following the 15 October rate cut, market expectations of interest rate levels were revised down considerably and general uncertainty increased. The mean expectation of three-month interest rates at September 1999 fell by a further 35 basis points, with rates falling sharply at first, then declining modestly throughout the period. There is a significant expectation that three-month rates could fall below 4% by September 1999, and virtually no expectation that interest rates will increase.

Within Europe, monetary policy has been influenced by participation in the single currency. While German official rates remained unchanged, monetary policy in countries with higher official interest rates (Italy, Ireland, Spain and Portugal) was eased, as interest rates continued to converge towards a single European interest rate. As Chart 19 shows, there has been a steady convergence since 1997. Italy, which has experienced some of the highest nominal rates in the prospective euro area, lowered official interest rates by 1 percentage point on 27 October as inflationary pressures remained weak and concerns about the 1999 budget receded. Interest rate movements in Denmark, which is outside the euro area, were more volatile. Interest rates increased by 100 basis points in September, owing to downward pressure on the currency. That rise was partly reversed in October, as rates were lowered first by 25 basis points, then by a further 10 basis points.

The monetary policy easing by a number of advanced economies in September and October should support economic activity in these regions, against the headwinds of lower world trade and financial market volatility. The outlook for the world economy deteriorated in the period under review, and prospects remain uncertain. But there were some positive developments at the end of the period. The bank rescue package implemented in Japan in mid October may help to restore the banking system to a sounder footing and bolster confidence. And the IMF package for Brazil, together with the measures announced after the general election, seems to have stabilised the situation in Latin America. These developments restored some measure of stability to the world economy at the end of a turbulent three months.

Public sector debt: end March 1998

This article[1] *continues the annual series in the* Quarterly Bulletin *analysing the debt position of the UK public sector. It looks at developments in net and gross debt in the financial year to end March 1998, and examines some of the domestic and European issues that have influenced these measures. It also analyses the composition and distribution of the national debt.*

The Office for National Statistics published the UK National Accounts in line with the updated European System of Accounts (ESA95) for the first time in September. This has had a number of implications for how debt levels are compiled. To ensure consistency with the previous articles in this series during the transition period, the data presented here are based on the previous accounting system. However, details of the changes and estimates of how they affect public sector debt are explored in the box on pages 334–35.[2]

- *In March 1998, the nominal value of the public sector's net debt stood at £352 billion, virtually unchanged from the March 1997 level of £350 billion. As a percentage of GDP,*[3] *this was a fall of almost 2 percentage points. Total central government gross debt increased by £2 billion in 1997/98, to £403 billion.*

- *The ratio of general government consolidated gross debt to GDP on a Maastricht basis fell during 1997/98 to 51.7%, remaining comfortably within the 60% reference level in the Maastricht Treaty. The general government financial deficit has fallen below its reference value of 3% for the first time since 1991, to 0.7% of GDP for the year to March 1998.*

- *The responsibility for gilt issuance and sterling debt management was transferred from the Bank of England to the UK Debt Management Office, an executive agency of HM Treasury, on 1 April 1998. The transfer of cash management is not expected before the end of the year at the earliest.*

Introduction

The article begins by looking at the debt of the public sector (central government, local authorities and public corporations) and how this is related to the Public Sector Net Cash Requirement (PSNCR). The second section focuses on central government debt, as this is by far the largest component of public sector debt. Central government debt is largely composed of the liabilities of the National Loans Fund (the 'national debt'), so the next section looks at the market holdings of these liabilities by instrument. It starts by looking at British Government Securities (gilts), the structure of the outstanding gilt portfolio and developments in the gilt market during 1997/98. The other main national debt instruments are then considered—National Savings instruments, sterling Treasury bills and foreign currency debt. The following section gives an analysis of the sterling national debt by holder of the debt instruments. Finally, the article describes the effects on the debt of the recent transition in the UK National Accounts to the revised European System of Accounts (ESA95). It also looks at European debt measures compiled in line with the Maastricht Treaty.

Public sector debt

The net debt of the public sector increased by just over 0.5% in the financial year 1997/98, from £350 billion to £352 billion (see Table A). Since GDP grew more strongly, this led to a fall of almost 2 percentage points in the ratio of debt to GDP. Within the total increase, the gross debt of central government increased by just under 0.5% and that of local authorities by just over 0.5%; the gross debt of public corporations fell by slightly more than 1%. The public sector's holdings of liquid assets, which are deducted from gross debt in the calculation of net debt, fell by more than 2%, from £52 billion to £51 billion (see Table B). This decrease in liquid assets reflects a fall in holdings of central

(1) By Bethany Blowers of the Bank's Monetary and Financial Statistics Division.
(2) Changes to the National Accounts are discussed in detail in the article on pages 361–67.
(3) The percentage of GDP data shown here, unless stated otherwise, are based on the average measure of GDP, at current market prices, for four quarters centred on 31 March. The GDP data for 1998 have been estimated.

Table A
Public sector net debt

£ millions, nominal values (a); percentages in italics

31 March (b)	1996	1997	1998	Changes 1997–98
Central government				
Market holdings of national debt (Table D)	343,977	369,333	372,621	3,288
as a percentage of GDP	*47.1*	*47.6*	*45.7*	*-1.9*
Net indebtedness to Bank of England Banking Department	0	1,149	1,065	-84
Savings banks	1,432	1,419	1,399	-20
Accrued interest and indexing on National Savings	3,517	3,422	2,932	-490
Notes and coin in circulation	23,427	25,638	24,768	-871
Other	359	423	496	73
Total central government gross debt	**372,711**	**401,384**	**403,281**	**1,897**
as a percentage of GDP	*51.0*	*51.7*	*49.5*	*-2.2*
Local authorities				
Total gross debt	50,252	51,299	51,649	350
less holdings of other public sector debt:				
Central government holdings of local authority debt	41,266	42,555	43,390	835
Local authority holdings of central government debt	153	155	170	15
General government consolidated gross debt	**381,544**	**409,973**	**411,370**	**1,397**
as a percentage of GDP	*52.2*	*52.8*	*50.5*	*-2.3*
Public corporations				
Total gross debt	26,595	26,093	25,805	-288
less holdings of other public sector debt:				
Central government holdings of public corporation debt	25,980	25,599	25,429	-170
Local authority holdings of public corporation debt	0	1	0	-1
Public corporation holdings of central government debt	6,500	7,781	8,124	343
Public corporation holdings of local authority debt	890	805	809	4
Public sector consolidated gross debt	**374,768**	**401,880**	**402,813**	**933**
as a percentage of GDP	*51.3*	*51.8*	*49.4*	*-2.4*
Total public sector liquid assets (Table B)	**52,643**	**52,093**	**50,864**	**-1,229**
as a percentage of GDP	*7.2*	*6.7*	*6.2*	*-0.5*
Net public sector debt	**322,125**	**349,787**	**351,949**	**2,162**
as a percentage of GDP	*44.1*	*45.0*	*43.2*	*-1.8*
Memo item:				
General government consolidated gross debt (Maastricht basis)	**380,231**	**408,633**	**410,461**	**1,828**
as a percentage of GDP (ESA) (c)	*53.5*	*54.6*	*51.7*	*-2.9*

(a) Figures may not sum to totals because of rounding.
(b) Data from 1970–98 are published in the *Bank of England Statistical Abstract 1998*, Part 1, Table 13.1.
(c) Financial-year GDP as measured on an ESA79 basis (see the box on pages 334–35).

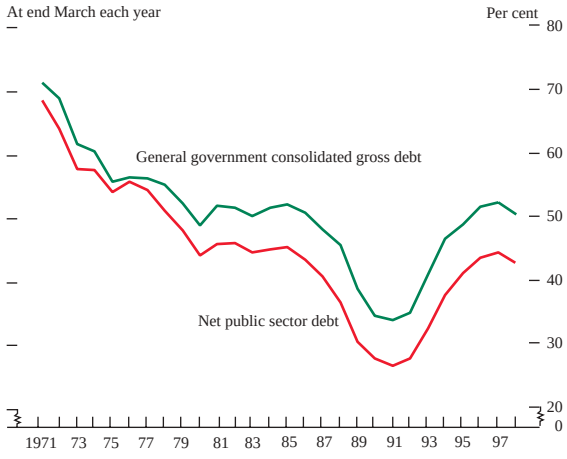
Table B
Public sector liquid assets

£ millions, nominal values

31 March (a)	1997	1998	Changes 1997–98
Central government			
Gold and foreign exchange reserves	25,547	21,293	-4,254
Commercial bills (including those held under repo)	1,790	4,126	2,336
British government stock held under repo (b)	6,081	5,994	-87
Treasury bills held under repo	41	0	-41
Loans against export credit and shipbuilding paper	0	0	0
Net claim on Bank of England Banking Department	0	0	0
Bank and building society deposits	2,067	2,249	182
Total central government liquid assets	**35,526**	**33,662**	**-1,864**
Local authorities:			
Bank deposits	7,134	7,994	860
Building society deposits	4,142	3,796	-346
Other short-term assets	3,256	3,693	437
Total local authority liquid assets	**14,532**	**15,483**	**951**
Public corporations			
Bank deposits	1,773	1,467	-306
Other short-term assets	262	252	-10
Total public corporation liquid assets	**2,035**	**1,719**	**-316**
Total public sector liquid assets	**52,093**	**50,864**	**-1,229**

(a) Data from 1970–98 are published in the *Bank of England Statistical Abstract 1998*, Part 1, Table 13.1.
(b) Excludes repos between public sector bodies. Claims arise in connection with the Bank of England's provision of liquidity to the money markets through its gilt repo facility. Take-up of liquidity is variable, depending on the prevailing and expected level of interest rates and forecasts of money-market liquidity.

Chart 1
Measures of public sector debt as a percentage of GDP



government and public corporations of £2 billion and £0.3 billion respectively, partly offset by an increase of almost £1 billion in local authorities' holdings.

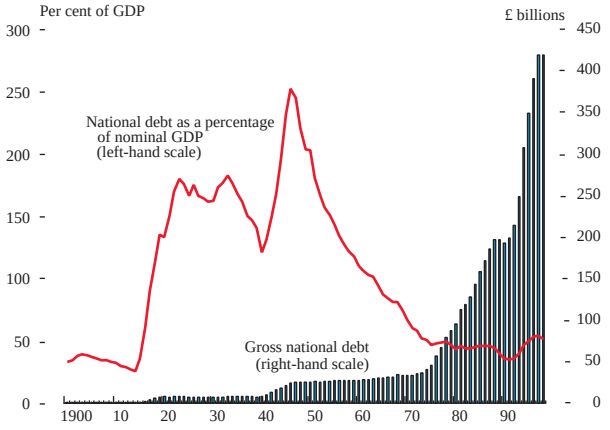
This decrease in the ratio of net public sector debt to GDP is the first fall in the ratio since it began to rise sharply in 1991 (see Chart 1); the same is true for general government gross debt.(1) Recent HM Treasury figures, published in June 1998 in the 'Economic and Fiscal Strategy Report', project that net public sector debt will continue to fall as a percentage of GDP after 1998, to 38% (based on current expenditure plans) by the end of 2001/02.

Chart 2 shows that recent debt levels as a percentage of GDP remain low by historical standards. The debt to GDP ratio may decrease, even as the nominal debt stock increases, if nominal GDP growth outpaces the rise in the debt stock, because of either inflation or real output growth. Increases in inflation erode the real value of the debt (except for index-linked debt).

Greater attention is being paid to the net public sector debt to GDP ratio this year, as the Government focuses on its 'sustainable investment' rule. This rule states that net public sector debt, as a proportion of GDP, will be held at a stable and prudent level over the economic cycle. The Government believes that this level should be reduced to below 40% of GDP. In line with this shift in focus on fiscal policy, the Office for National Statistics has changed the

(1) See the Annex on page 336, which provides definitions of the different debt measures.

Chart 2
Gross national debt: 1900–98



Source: HM Treasury.

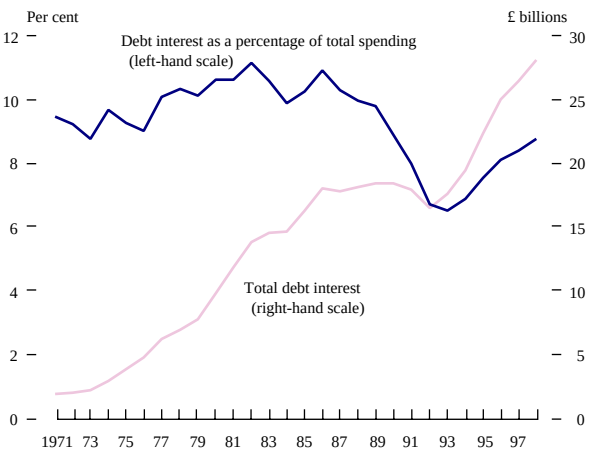
way in which public finances are presented (see the box in the adjacent column).

The Government focuses particularly on the ratio of debt to GDP because nominal GDP is closely related to the tax base of the economy, and so to the Government's ability to service the debt. Any current fiscal stance is considered sustainable if the Government can maintain its current spending and taxation policies indefinitely, while continuing to meet its debt-servicing obligations.

Interest payments on public sector debt in 1997/98 rose from almost £27 billion to more than £28 billion, continuing the upward trend in this series since 1993 (see Chart 3). The level of interest payments within the PSNCR, at 8.9%, was the highest percentage of total spending since 1989/90, but smaller than at any time between 1970/71 and 1989/90. The Government has continued to emphasise its aim of reducing the debt interest bill, through policies to reduce both gilt yields and the volume of borrowing.

Chart 3
Public sector debt interest

At end March each year



Source: Office for National Statistics.

The new presentation of public finances

In June, the Office for National Statistics presented statistics on public finances in a new format. This allowed the public accounts to correspond more closely with both the National Accounts and with the Government's two fiscal rules: the *sustainable investment rule* (as explained on page 325), and the *golden rule*, which states that over the economic cycle, the Government will borrow only to invest and not to fund current spending. So the changes were made primarily to focus on a measure of budget balance that excludes financial transactions, and to separate the current and capital accounts. In line with this, the format has moved the emphasis away from the Public Sector Net Cash Requirement (PSNCR), previously the PSBR, to the following fiscal measures:

- *Public sector current balance*. This shows whether all current spending is being financed by current receipts, which allows an assessment of whether the Government's 'golden rule' will be met over the economic cycle.
- *Public sector net borrowing*. This excludes privatisations and other financial transactions, and is equivalent to the public sector financial surplus/deficit in previous UK National Accounts.

This second measure of the fiscal stance tightened considerably in 1997/98; projections published by the Government in June forecast that this tightening will continue. The tightening in 1997/98—of more than 2% of GDP—was the largest change in cyclically adjusted public sector net borrowing since 1981. The estimated current budget for 1997/98 was close to balance, with a steadily rising surplus expected in the medium term, to a level of £13 billion in 2001/02 (not cyclically adjusted).

Public sector net debt and the PSNCR are closely related. The stock of debt is basically the sum of previous net cash requirements, and so the change in debt for a given year is approximately that year's PSNCR. The box on page 327 explains why these measures, though closely related, are not equal.

The PSNCR declined very sharply in 1997/98, from more than £22.5 billion to just over £1 billion (see Table C). Within this, the central government net cash requirement fell from £25 billion to just under £3.5 billion. Local authorities slightly decreased their net repayment. Public corporations' net repayment also fell, from £1.4 billion to £0.7 billion.

The new format of the public finances also brings the United Kingdom closer into line with international standards, and is consistent with concepts used for international comparisons of budget deficits. The deficit

The PSNCR and changes in public sector net debt: reconciliation

Public sector net debt is a stock measure, and its change is calculated on a nominal, accrued basis. By contrast, the PSNCR, financed by transactions in assets and liabilities, is measured on a cash-flow basis. This leads to small differences between the change in public sector net debt and the PSNCR for any given period, mainly because of the following:

- The value of foreign currency liabilities and assets is affected by fluctuations in exchange rates, and so the debt changes independently of any transactions that affect the PSNCR.
- When gilts are issued (or bought in ahead of their redemption date) at a discount or premium, the PSNCR is financed by the actual cash amount received (or paid out). The level of debt, however, is deemed to have changed by the nominal value of gilts issued (or redeemed). Current practice is to issue gilts with coupons close to the market rate at the time of initial issue, so discounts/premia are usually small.
- The capital uplift on index-linked gilts is recorded in the PSNCR only when it is paid out, ie when the stock is redeemed. In the measure of debt outstanding, it is accrued over the life of the stock.

£ billions	Year ending March 1998
PSNCR	**1.1**
Plus	
Revaluation of foreign currency assets/liabilities	0.9
Capital uplift on index-linked gilts	1.8
Discount/premium on gilt issues	-0.5
Other	-1.3
Equals	
Change in public sector net debt	**2.0**

Note: Figures may not sum to total because of rounding.

Table C
Composition of the PSNCR[a]

£ millions

	1996/97	1997/98
Central government net cash requirement (CGNCR)	**25,051**	**3,411**
Memo item: CGNCR on own account	24,890	2,524
Local authority net cash requirement (LANCR)	-838	-820
less borrowing from central government	*1,517*	*955*
General government net cash requirement (GGNCR)	**22,696**	**1,636**
Public corporations' net cash requirement (PCNCR)	-1,395	-654
less borrowing from central government	*-1,356*	*-68*
Public sector net cash requirement (PSNCR)	**22,657**	**1,050**
As a percentage of GDP	*2.9%*	*0.1%*

(a) Prior to the transition to ESA95—see the box on pages 334–35.

measure examined under the Maastricht Treaty is the general government financial deficit (GGFD), as defined by European national accounting standards. In the year to March 1998, the United Kingdom's GGFD was 0.7% of GDP, and so lay well below the 3% Maastricht reference level. This contrasts significantly with the year to March 1997, when GGFD was 4.0% of GDP.

To monitor debt under the Maastricht convergence rules, EU Member States use the harmonised measure of the ratio of general government consolidated gross debt to GDP. For the year to March 1998, the United Kingdom's general government debt was 51.7% of GDP (with both concepts defined according to European standards of national accounting), and so remained comfortably within the 60% Maastricht reference level. The decision about which Member States should move to the third stage of the single currency process was taken in May 1998, after submission of 1997 data. Further information on these European debt and deficit issues is given in the box on pages 334–35.

Analysis of central government debt by instrument

As shown in Table A, public sector debt is made up almost entirely of central government debt, of which by far the biggest constituent is market holdings of national debt. Total national debt represents the liabilities of the National Loans Fund.(1)

During 1997/98, total national debt fell by just over £1/2 billion (see Table D). Within this, market holdings of national debt increased by £3 billion to almost £373 billion, an increase over the year of almost 1%. Offsetting this, official holdings(2)—holdings by other central government bodies and the Issue and Banking Departments of the Bank of England—decreased by £4 billion. The structure of market holdings of national debt remained broadly unchanged from 1997, as did marketable debt, the proportion of debt that can be traded in a secondary market (gilts, Treasury bills and some foreign currency instruments). The composition of market holdings of national debt is shown in Chart 4. A more detailed analysis of the major national debt instruments is given later.

At end March 1998, there were four main components of central government debt, other than market holdings of national debt. Two were the ordinary account deposits lodged in the National Savings Bank, and accrued interest and indexing on other National Savings products. The other two were net indebtedness to the Bank of England Banking Department, and notes and coin in circulation (though this has now changed, as the United Kingdom has moved to a new EU standard of national accounting—see the box on pages 334–35). These last two items also partly offset the effect of subtracting official holdings from national debt

(1) Stocks of nationalised industries guaranteed by the government are not strictly part of the national debt, but would be included here since the market does not generally distinguish them from government stocks; no such stocks are currently outstanding.
(2) See the box on pages 334–35 for an explanation of official holders both prior to, and following, the introduction of ESA95.

Table D
Market and official holdings of national debt

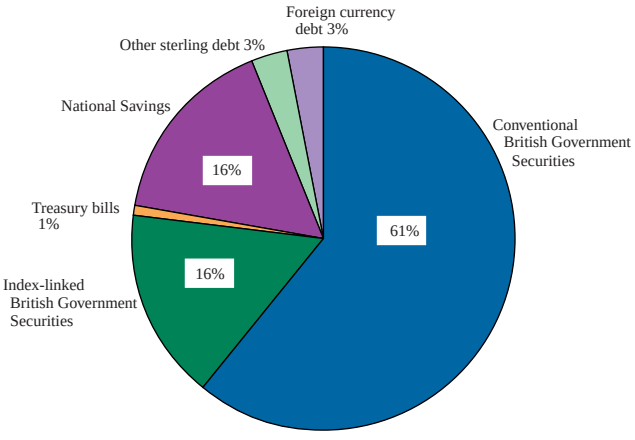
£ millions, nominal values; *percentage of market holdings in italics*

End March (a)	1997		1998	
Market holdings				
British government stocks	281,780	*76.3*	289,418	*77.7*
of which: index-linked	51,534	*14.0*	58,728	*15.8*
other	230,246	*62.3*	230,691	*61.9*
Treasury bills	4,952	*1.3*	2,091	*0.6*
National Savings	56,915	*15.4*	58,963	*15.8*
of which: index-linked	8,076	*2.2*	8,910	*2.4*
other	48,839	*13.2*	50,053	*13.4*
Interest-free notes due to the IMF	5,638	*1.5*	5,162	*1.4*
Certificates of tax deposit	852	*0.2*	706	*0.2*
Other	4,855	*1.3*	4,819	*1.3*
Market holdings of sterling debt	**354,992**	***96.1***	**361,159**	***96.9***
North American government loans	644	*0.2*	533	*0.1*
US$ floating-rate note	1,227	*0.3*	1,194	*0.3*
US$ bonds	3,067	*0.8*	2,985	*0.8*
Ecu Treasury bills	2,488	*0.7*	2,248	*0.6*
Ecu 9 1/8% 2001 bond	1,777	*0.5*	1,606	*0.4*
Ecu Treasury notes	3,199	*0.9*	2,890	*0.8*
DM 7 1/8% 1997 bond	1,828	*0.5*	0	*0.0*
Debt assigned to the government	111	*0.0*	7	*0.0*
Market holdings of foreign currency debt (b)	**14,341**	***3.9***	**11,462**	***3.1***
Total market holdings of national debt	**369,332**	***100.0***	**372,621**	***100.0***
Official holdings	50,577		46,623	
Total national debt	**419,909**		**419,244**	

(a) Data from 1970–98 are published in the *Bank of England Statistical Abstract 1998*, Part 1, Table 13.2.
(b) Sterling valuation rates:
31 March 1997: £1 = US$ 1.6303, Can$ 2.2448, ECU 1.4068, DM 2.7345.
31 March 1998: £1 = US$ 1.6745, Can$ 2.3821, ECU 1.5565, DM 3.0963.

when calculating central government debt. Net indebtedness reflects the Banking Department's holdings of central government debt, and notes in circulation are backed by assets held by the Bank of England Issue Department. Some of these assets are national debt instruments. So central government gross debt and national debt are very closely related.

Chart 4
Composition of market holdings of national debt by instrument: at end March 1998



National debt instruments

British Government Securities

British Government Securities (gilts) are the largest component of national debt. In March 1998, market holdings of gilts(1) were almost £289.5 billion, accounting for 78% of total market holdings of national debt. This was a rise of almost 3% from the previous year. Within this, there was a 14% increase in market holdings of index-linked gilts, taking the total outstanding to nearly £59 billion.

In total, £20 billion of conventional gilts were issued during 1997/98. The majority of these were extra issues of existing stocks (7% Treasury Stock 2002, 8% Treasury Stock 2021 and 7 1/4% Treasury Stock 2007). Two new conventional stocks were also created: a five-year benchmark (6 1/2% Treasury Stock 2003) in December, and a long benchmark (6% Treasury 2028) in January. The lower coupons of the new issues brought down the weighted-average coupon of conventional issues over the year to 7.2%, from 7.6% last year.

All conventional gilt issuance in 1997/98 was done via sales at auctions. This completed a process begun in 1990/91 to move away from tap issues of conventional gilts, to the more structured and predictable system that auctions allow. The government has reiterated its policy that gilt issuance of conventional stocks via taps will be used as a market management instrument only if there is temporary excess demand in a particular stock or sector. It envisages that such tapping will account for less than 5%, if any, of expected total conventional issues in 1998/99.

Index-linked issuance in 1997/98 was £2.9 billion nominal (not including capital uplift), conducted solely via the tap mechanism. During the year, HM Treasury, along with the UK Debt Management Office (DMO)(2) and the Bank of England, discussed with a range of market participants their proposals for moving index-linked gilt issuance to an auction programme. Firm proposals on the format of index-linked auctions were published on 10 June 1998, and a separate list of index-linked gilt-edged market makers was issued on 10 September 1998. Following these, the first index-linked auction will take place on 25 November 1998. The Government intends that this will be the primary issuance method for index-linked as well as conventional gilts in the longer term.

The forecast in March 1997 for the gross gilt sales target for 1997/98 was £36.5 billion. This was lowered to £25.1 billion in July 1997, in the Government's first Budget, following a reduction in the Central Government Net Cash Requirement from £20 billion to £12.4 billion. The target announced in the *Pre-Budget Report* in November 1997 was £25.4 billion. Actual gilt sales over the year were £25.8 billion.

(1) Unless otherwise stated, all figures are in nominal terms and include capital uplift accrued on index-linked stock.
(2) See the box on page 329 for details on the role of the UK DMO.

The role of the UK Debt Management Office

On 6 May 1997, the Chancellor announced that the Bank of England's role as the Government's agent for debt management, cash management and oversight of the gilts market was being transferred to HM Treasury. This formed part of his announcement granting the Bank operational independence to set interest rates; the transfer was deemed necessary to ensure that debt management decisions could not be perceived as being influenced by inside information on interest rate decisions.

In light of this, the UK Debt Management Office (DMO)—an executive agency of HM Treasury—was established on 1 April 1998, with the responsibility for all official operational decision-making in the gilt market. It is not expected that cash management will transfer from the Bank before end December 1998. The aim of the DMO is to carry out the Government's debt management policy of:

> 'minimising over the long term the cost of meeting the Government's financing needs, taking into account risk, whilst ensuring that debt management policy is consistent with the objectives of monetary policy'.

This is achieved by pursuing an issuance policy that is open, predictable and transparent, and developing a liquid and efficient gilts market. The DMO has eight strategic objectives that flow from its aim. These are set out in a *Framework Document*, published in March 1998, and broadly relate to:

- meeting the Government's gilt Remit;
- maintaining market liquidity;
- responding to the demand for new products;
- providing a high-quality service to customers; and
- developing a successful cash-management function.

In institutional terms, the DMO is legally and constitutionally part of HM Treasury but, as an executive agency, it operates at arm's length from ministers. The Chancellor of the Exchequer determines the policy and financial framework within which the DMO operates, but delegates to the Chief Executive operational decisions on debt and cash management, and day-to-day management of the Office. The Chief Executive is accountable to Parliament for the DMO's performance and operations, both for the Office's administrative costs and for the Debt Management Account—the warehousing account being established to handle debt and cash management operations.

In May 1998, the DMO published its *Corporate Overview and Business Plan 1998/99*. The Corporate Overview develops a strategic framework for the next three years, identifying the main aims of the DMO, possible changes in its environment, and how it will be organised to meet its policy objectives. The Business Plan focuses in more detail on the activities, priorities and risks in 1998/99.

The 1997/98 Remit also specified that about 20% of gilt sales should be index-linked, with the remainder split broadly evenly between short, medium and long-dated conventionals. The actual distribution of sales came very close to this target.

Five stocks, totalling £20 billion, were redeemed during the year, including the largest single redemption in the history of the UK gilt market: £8,150 million of 7¼% Treasury Stock 1998.

Structure of the gilt portfolio

The maturity structure of the stock of gilts outstanding at end March 1998 was slightly longer than at end March 1997 (see Table E). The average remaining maturity of all dated stocks in market hands rose from 10.1 years to 10.2 years. Excluding index-linked gilts, average maturity rose from 8.8 years to 9.0 years. This partly reflects the increased emphasis on long-dated issuance with the creation of 6% Treasury Stock 2028 in January. The maturities of dated stocks in market hands as at end March 1998 are shown in Chart 5.

Table E
Average remaining life of dated stocks in market hands[a]

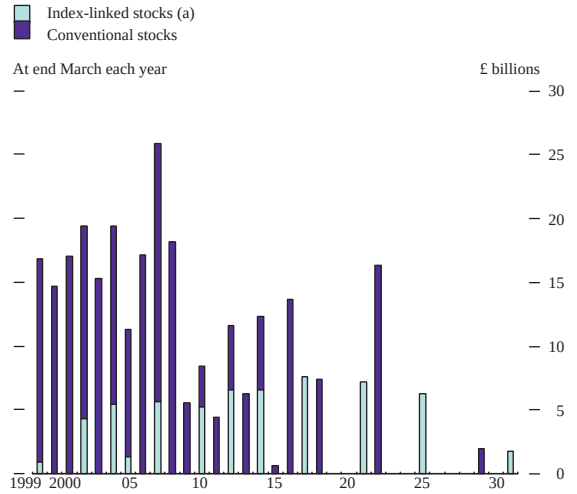
Years to maturity at 31 March

	1991	1992	1993	1994	1995	1996	1997	1998
Latest possible redemption:								
All dated stocks [b]	9.9	10.0	10.8	10.6	10.4	10.1	10.1	10.2
Excluding index-linked stocks	8.0	8.4	9.4	9.1	9.1	8.8	8.8	9.0
Earliest possible redemption date:								
All dated stocks	9.6	9.8	10.5	10.4	10.2	9.9	9.9	10.0
Excluding index-linked stocks	7.7	8.1	9.0	8.9	9.1	8.8	8.7	8.9

(a) These data are based on the nominal value of dated stocks in market hands at 31 March each year.
(b) Index-linked stocks are given a weight reflecting capital uplift accrued to 31 March.

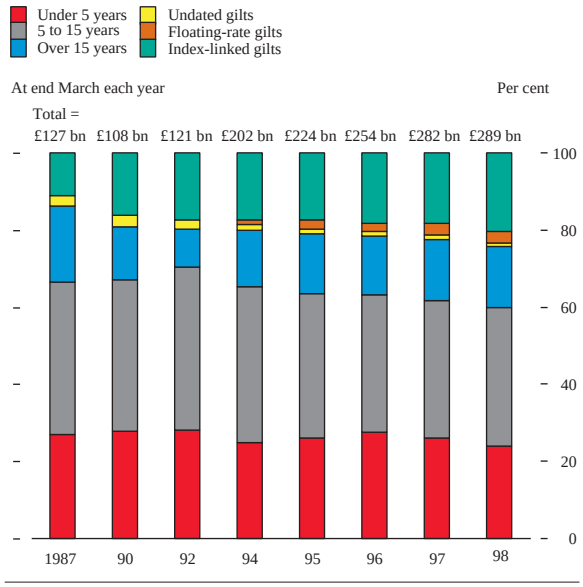
The most marked change in market holdings of gilts across each type of instrument in 1997/98 was an increase of 2 percentage points in the proportion of market holdings of gilts held as index-linked gilts. This came mainly at the expense of reduced holdings of short-dated conventional gilts. Overall, the proportions of each type of gilt held by the market remained similar to last year. Chart 6 shows how the breakdown of market holdings of gilts in 1997/98 compares with the previous decade.

Chart 5
Maturities of dated stocks in market hands (as at end March 1998)



(a) Figures include accrued capital uplift to 31 March 1998.

Chart 6
Breakdown of market holdings of gilts

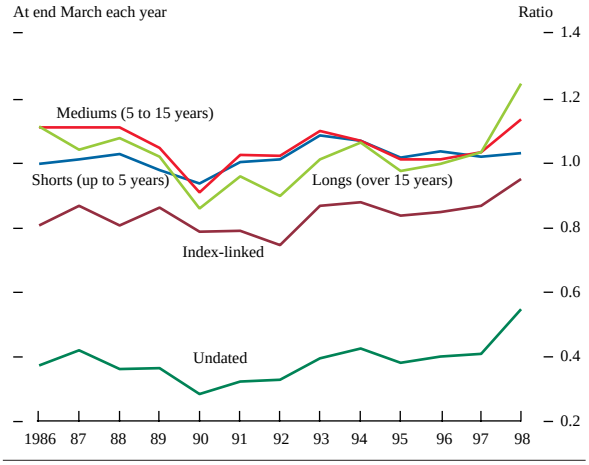


The gilt market in 1997/98

1997/98 was a strong year for the UK gilt market, partly reflecting lower inflation expectations, with the Bank of England having been given operational responsibility for interest rate decisions. The UK gilt market also took on a 'safe-haven' status from both EMU uncertainty and, later in the year, turbulence in Far Eastern markets. Gilt yields fell sharply; at the longer end, they reached their lowest levels since the 1960s, falling by almost 200 basis points. Medium and short yields also fell during the year, by 79 basis points and 122 basis points respectively.

This strength could also be seen clearly in the ratio of the market:nominal value of gilts. The market value of all gilts in market hands at end March 1998 was £316 billion, 9% higher than the nominal value. This was a large premium compared with the previous year, when the nominal and market values were very close, and 1996, when there was a discount of 1.3%. The market:nominal ratios for each category of gilts for the past decade are shown in Chart 7. For index-linked gilts, the nominal value includes capital uplift accrued to 31 March each year.

Chart 7
Ratios of market to nominal values of stocks in market hands



The premium on long-dated stocks of 25.5% took the market:nominal value ratio above those for short and medium-dated stocks for the first time in ten years. The premia on short and medium-dated stocks were 4.1% and 14.5% respectively. Index-linked gilts were trading at a discount of 4% at end March 1998. Overall, the market value of the undated stocks has a disproportionate effect on the total ratio; they account for 1% of total gilts in market hands, but normally trade at less than 50% of their nominal value.

A significant development in the gilt market in 1997/98 was the launch of the official strips facility on 8 December 1997. The concentration on issuance in strippable benchmark issues with common coupon dates has partly been aimed at building up the potential size and liquidity of the strips market. However, activity in the strips market has so far been low, with limited participation by institutional investors. The total nominal amount of strippable stocks outstanding on 30 March 1998 was £84 billion. Of this, 2% were stripped.

The financing Remit for 1998/99

The Government's Remit to the DMO was published in March 1998, with a target for gilt sales in 1998/99 of £14.2 billion. The target for index-linked issuance was increased from 20% to 25% of this total. Of the remainder, the maturity structure for conventional gilt issuance in the Remit specified long issuance of 50%, and short and medium issuance of 25% each. This is a change from previous years, in order to build up the outstanding issue of the new long benchmark conventional gilt, to allow it to

become strippable, and to support the move to index-linked auctions. However, the Government has specifically stated that it will not necessarily continue with these proportions in the future.

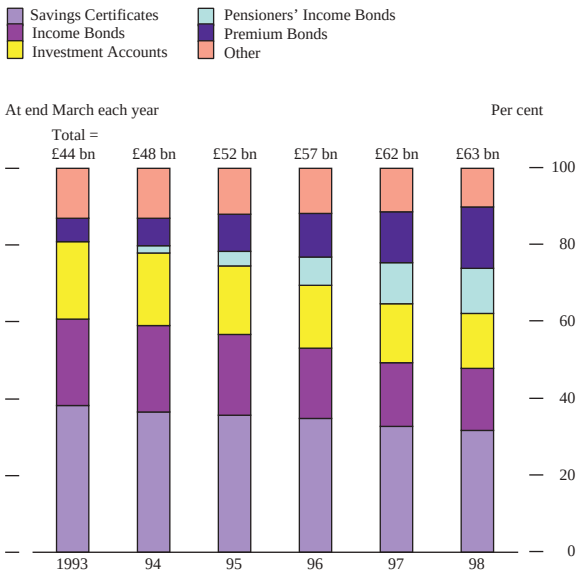
The Government revised the gilt funding requirement downward in June to £11.6 billion, reflecting a larger funding overshoot from 1997/98 and a lower estimate of the Central Government Net Cash Requirement for 1998/99. Following this, the previous emphasis towards long-dated sales was reduced, and the proportion of planned index-linked sales was further increased, to keep the original notional amount to be issued constant at around £3.5 billion. The revised Remit proportions were 30% index-linked and 70% conventional, with the latter split between 38% long and 31% each of short and medium issuance.

National Savings

At March 1998, £63.3 billion of National Savings instruments was outstanding. This increase of £1.5 billion from the previous year constitutes the net funding contribution during the year. The gross sales of National Savings products for 1997/98 was approximately £13 billion.

The composition of total products outstanding remained broadly the same as last year (see Chart 8). The proportion of savings held in Premium Bonds again rose, from 13% to 16% of the total, compared with only 6% in 1993. The share of Pensioners' Income Bonds also continued to increase, rising by 1 percentage point over the year. These increases have come largely at the cost of reduced holdings of conventional Income Bonds and Investment Account deposits.

Chart 8
Composition of National Savings by product



Source: Department for National Savings.

National Savings products are treated slightly differently in the national debt and central government debt. Total National Savings products outstanding include approximately £4.3 billion of ordinary account deposits with the National Savings Bank, and accrued interest and index-linked increments on other National Savings products. These are excluded from the national debt, but included when calculating central government debt. National Savings products accounted for almost 16% of market holdings of national debt in 1997/98.

The net contribution of National Savings to the Government's financing programme for 1998/99 was initially expected to be around £1 billion, with gross sales of around £12 billion. This was subsequently reduced to £0.5 billion in June.

Sterling Treasury bills

Market holdings of Treasury bills fell sharply in 1997/98 from £5 billion to £2 billion, to just over 0.5% of market holdings of national debt. This followed a similar fall of more than 50% in 1996/97. The more recent fall reflects a reduction in the size of the Treasury bill tender during 1997/98 to relieve the pressure on the daily money-market shortages—in April 1997, the weekly tender fell from £400 million to £200 million, and fell further in October 1997 to £100 million per week. In July 1997, a weekly tender of £300 million of 28-day Treasury bills was introduced, which ran until September 1997. This was a technical adaptation to the regular programme of Treasury bill issues, designed to smooth the pattern of daily money-market shortages/surpluses, and to take particular account of the large redemption of £5.6 billion of 8¾% Treasury Stock 1997 on 1 September 1997.

The Government restated in the *Debt Management Report* that it had no plans to use marketable debt instruments of less than three years' maturity to meet the financing requirement. This means that the outstanding stock of Treasury bills is largely determined by the Bank of England's sterling money-market operations. The responsibility for the government's cash management is not expected to transfer to the DMO before the end of this year (see box on page 329). This will include responsibility for the issuance and management of Treasury bills.

Foreign currency debt

The sterling value of market holdings of foreign currency debt outstanding, shown in Table D, fell by 20% during 1997/98, from £14.3 billion to £11.5 billion. As a result, foreign currency debt as a proportion of total market holdings of national debt fell from 4% to 3% of the total. This largely reflected the redemption in October 1997 of the 7.125% DM 5 billion bond, which was not refinanced. Part of the fall can also be attributed to sterling's appreciation over the year.

Sterling national debt: analysis by holder

Tables F and G show an estimated distribution by sector of the sterling national debt at end March 1998.(1)

Table F shows that this distribution has remained broadly unchanged from last year. Institutional investors remain by far the largest holders of sterling national debt, accounting for 53% of total market holdings in 1997/98, having increased their holdings by £19 billion during the year. Table G shows that these holdings are concentrated largely in medium and long-dated stocks, reflecting the institutions' need to match their assets with their typically longer-term liabilities. Insurance companies increased their holdings of gilts by 6% during the year, and investment and unit trusts by 5%. Pension funds' holdings of gilts increased by £13 billion, to 25% of total market holdings of gilts. This was up from 22% of total market holdings of gilts in 1997/98, and shows pension funds again increasing their involvement in this market. This may have been encouraged by the introduction of the minimum funding requirement solvency test, which came into force in April 1997, following the Pensions Act 1995.

The sharp fall in building societies' holdings of sterling national debt instruments (from £6.9 billion in 1996/97 to £1.0 billion in 1997/98) partly reflects the conversion of a number of building societies into banks, leaving a much reduced building society sector. Banks did not show a corresponding increase; their holdings of sterling national debt instruments fell by some £7 billion. The maturity distribution of their remaining holdings of gilts was broadly the same as in 1996/97: in 1997/98, their holdings of

Table F
Distribution of the sterling national debt: summary(a)

£ billions; *percentage of market holdings in italics*

Amounts outstanding at 31 March	1997		1998		Change in 1997/98
Market holdings					
Other public sector	7.0	*2.0*	7.1	*2.0*	0.1
Banks	20.4	*5.7*	13.9	*3.9*	-6.5
Building societies	6.9	*2.0*	1.0	*0.3*	-5.9
Other financial institutions	173.3	*48.8*	192.4	*53.3*	19.1
Overseas residents	48.4	*13.6*	57.2	*15.8*	8.8
Individuals and private trusts	68.6	*19.3*	74.4	*20.6*	5.8
Other (including residual)	30.2	*8.5*	15.0	*4.2*	-15.2
Total market holdings	**355.0**	***100.0***	**361.2**	***100.0***	**6.3**
Official holdings	49.3		45.6		-3.7
Total sterling debt	**404.3**		**406.8**		**2.5**

Note: Figures shown may not sum to totals because of rounding.

(a) See Table G for a more detailed analysis. Data for 1970–98 are published in the *Bank of England Statistical Abstract 1998*, Part 1, Table 13.

Table G
Estimated distribution of the sterling national debt: 31 March 1998

£ billions, nominal value (a) (b)

	Total holdings of sterling debt	British government stocks (c)				Treasury bills	Non-marketable debt
		Total	Up to 5 years to maturity	Over 5 years and up to 15 years	Over 15 years and undated		
Market holdings							
Other public sector:							
Local authorities	0.2	*0.2*	0.1	0.1	0.0	0.0	0.0
Public corporation	7.0	*2.1*	0.9	1.1	0.1	0.0	4.8
Total public sector	**7.1**	***2.3***	**0.9**	**1.2**	**0.2**	**0.0**	**4.8**
Banks	13.9	*13.5*	7.9	4.9	0.7	0.3	0.1
Building societies	1.0	*1.0*	0.8	0.2	0.0	0.0	0.0
Institutional investors:							
Insurance companies	114.2	*114.1*	21.1	50.6	42.4	0.1	0.0
Pension funds	73.9	*73.6*	13.3	40.6	19.8	0.3	0.0
Investment and unit trusts	4.3	*4.3*	1.4	2.0	0.9	0.0	0.0
Total institutional investors	**192.4**	***192.0***	**35.8**	**93.2**	**63.0**	**0.4**	**0.0**
Overseas holders:							
International organisations	5.2	*0.1*	0.0	0.0	0.0	0.0	5.2
Central monetary institutions	12.6	*11.9*	7.4	3.3	1.2	0.7	0.0
Other	39.4	*38.9*	11.7	17.1	10.0	0.5	0.0
Total overseas holders	**57.2**	***50.9***	**19.1**	**20.5**	**11.3**	**1.2**	**5.2**
Other holders:							
Individuals and private trusts	74.4	*15.2*	4.9	7.7	2.6	0.0	59.2
Industrial and commercial companies	1.2	*0.7*	0.3	0.3	0.2	0.1	0.4
Other (residual)	13.8	*13.8*	13.5	0.1	0.3	0.0	0.0
Total market holdings	**361.2**	***289.4***	**83.1**	**128.0**	**78.3**	**2.1**	**69.6**
Official holdings (d)	45.6	*7.9*	2.9	3.8	1.2	3.6	34.1
Total sterling national debt	**406.8**	***297.4***	**86.1**	**131.8**	**79.5**	**5.7**	**103.8**

Note: Figures shown may not sum to totals because of rounding.

(a) For explanations, see the notes to similar tables on pages 439–40 of the November 1992 *Quarterly Bulletin*.
(b) Some of these estimates are based on reported market values; others rely on broad nominal/market value ratios.
(c) A sectoral analysis of gilt holdings from 1970–98 is published in the *Bank of England Statistical Abstract 1998*, Part 1, Table 13.4.
(d) Official holders include the Issue and Banking Departments of the Bank of England.

(1) These tables are compiled from a variety of sources, though the majority of the data are taken from the ONS' quarterly and annual survey data of various financial and non-financial companies.

short-dated gilts (less than five years' residual maturity) accounted for 59% of their total gilt holdings, and in 1996/97 they accounted for 53%. Banks' holdings of Treasury bills decreased sharply again this year, from £2.7 billion in 1996/97 to £0.3 billion in 1997/98. This reflects a general fall in market holdings of Treasury bills. This fall also meant that overseas residents had the largest share of market holdings of sterling Treasury bills at end March 1998, with a 57% market share. (In 1996/97, banks were the largest holders, with 54% of the total.)

Individuals' and private trusts' holdings of sterling national debt instruments increased during 1997/98 by almost £6 billion, to £74.4 billion. The majority of holdings were again in National Savings products. Individuals' and private trusts' holdings of gilts increased by £3.6 billion, with the emphasis on short to medium-term holdings.

Total sterling national debt held by overseas residents increased during the year by £9 billion, almost entirely because of their increased investment in gilts. As in 1996/97, their investment was concentrated in the short to medium-term end of the market. This increase means that overseas residents' holdings of gilts accounted for just over 17.5% of total market holdings of gilts, an increase of more than $2^{1}/_{2}$ percentage points from 1996/97. As explained earlier, this may be because of the perception among overseas investors of the United Kingdom as a 'safe haven' from both EMU uncertainty and, later in the year, turbulence in Far Eastern markets.

European debt measures and the transition to the European System of Accounting

The European Union requires each European Member State to submit data on its debt and financial deficit twice a year under the 'Excessive Deficit Procedure'. These measures give an indication of each country's current budgetary situation; they form part of the overall package of convergence criteria against which each Member State's readiness to join Economic and Monetary Union (EMU) is assessed.

The Council of the European Union completed its analysis of which countries could move to the third stage of economic and monetary union in the first wave by looking at end-1997 data; Member States submitted their data to the European Commission in February 1998. In March 1998, both the European Commission and the European Monetary Institute published reports analysing the progress that each Member State had made towards convergence. The Commission also laid down its recommendations to the Council on which Member States had adequately fulfilled the convergence criteria.

European debt and deficit data for the United Kingdom

For 1997, the United Kingdom submitted levels for general government debt and deficit(1) of 53.4% and 1.9% of GDP respectively, both comfortably within the reference values of 60% and 3% identified in a protocol(2) to the Maastricht Treaty.(3) The latest ONS Maastricht press release in August 1998 revised these levels to 53.5% and 2.1% respectively, and to 51.7% and 0.7% for 1997/98. The fall in the deficit for 1997/98 continued the steep downward trend seen since 1994; between 1993/94 and 1997/98, the deficit as a percentage of GDP fell by a total of 7 percentage points. Recent government forecasts estimate that the deficit will be in balance in March 1999, followed by a steady surplus of between 0.1% and 0.3% of GDP in the medium term.

The 1.2 percentage points fall in debt during 1997, from 54.7%, was the largest fall since this measure was first compiled in 1991. Within this, 27% of the debt was classified as short term (less than one year to maturity), including debt linked to short-term interest rates. This short-term level was higher than that of almost two thirds of the other Member States. However, the UK level was distorted by its unique statistical compilation of debt, which included notes in circulation (treated as a debt of central banks in all other EU countries) and medium-term National Savings instruments with a residual maturity of less than one year. In 1997, these items amounted to around 17% of general government consolidated gross debt; this suggests that actually only some 10% of UK debt was sensitive to short-term interest rate changes. This treatment has changed since the United Kingdom adopted the revised European accounting standards, as outlined below.

Although the decision on which Member States will be part of EMU in the first wave has now been taken, future European debt and deficit data remain vitally important; all Member States will continue to report biannually under the Excessive Deficit Procedure. As well as providing further convergence data on those Member States that have not joined EMU in the first wave, they also form the basis on which adherence to the Stability and Growth Pact will be measured.

European System of Accounts

All Member States compile data for the Excessive Deficit Procedure according to a common accounting framework: the European System of National and Regional Accounts, second edition, 1979 (ESA79). Member States are gradually bringing their national accounts into line with a later edition of this framework, ESA95. (Data for the Excessive Deficit Procedure will remain on an ESA79 basis.) The Office for National Statistics (ONS) published UK National Accounts on an ESA95 basis for the first time in September this year.

The transition from UK National Accounts to ESA95

This transition from UK National Accounts to ESA95 affects how UK debt is compiled. Under ESA95, the ONS introduced a central bank sector, outside central government, into the National Accounts. This means that the sector classification of the Bank of England has changed. The central bank sector in the United Kingdom is now as follows:

- *The Bank of England Issue Department* has the primary function of issuing banknotes, and holds assets to back the note issue.

- *The Bank of England Banking Department* reflects the rest of the Bank's business, eg banker to the government, other UK banks and overseas central banks.

This central bank definition does not include the official reserves held in the Exchange Equalisation Account at

(1) The harmonised measures used for these monitoring purposes are the General Government Consolidated Gross Debt and the General Government Financial Deficit. Both these and the GDP measure are compiled according to the European System of Regional and National Accounts, 2nd edition, 1979.
(2) Protocol on the Excessive Deficit Procedure.
(3) Article 104c of the Treaty on European Union.

the Bank of England; these remain in the central government sector.

Prior to the implementation of ESA95, the Issue Department was classified in the National Accounts within the central government sector; notes issued by the Issue Department were recorded in central government debt as a liability of central government. The Banking Department was classified in the banking sector, and so as part of the market. However, Banking Department's holdings of national debt instruments were classified as official holdings, and reflected in central government debt through net indebtedness to the Bank of England Banking Department.

Both the Issue and Banking Departments of the Bank of England are now classified in the central bank sector, a sub-sector of the monetary financial institutions sector. As the Issue Department is now treated as part of the market, liabilities of the Issue Department—notes in circulation—are no longer counted as components of central government gross debt. Similarly, Issue Department's holdings of central government debt instruments are now treated as market holdings of debt. The Banking Department remains as part of the market. For simplicity, both the Banking and Issue Departments' holdings of national debt instruments are now classified as market holdings of national debt. The concept of net indebtedness to the Bank of England Banking Department therefore disappears.

Overall, these changes have led to a downward movement in gross debt measures, because Issue Department's assets include non-government debt instruments. The effect on net debt measures is broadly neutral, since decreases in gross debt have been offset by the reduction in central government's liquid assets. The table below illustrates these changes to central government gross debt in more detail.

Central government gross debt at end March 1998

£ millions

	Before introduction of central bank sector			*After introduction of central bank sector*	
	Market holdings of national debt (excludes holdings of the Issue and Banking Departments of the Bank of England).	372,621		Market holdings of national debt (*includes* holdings of the Issue and Banking Departments of the Bank of England).	*387,044*
+	Net indebtedness to Bank of England Banking Department	1,065		*Banking Department's holdings are included in market holdings of national debt*	*0*
+	Savings banks	1,399	+	Savings banks	1,399
+	Accrued interest and indexing on National Savings	2,932	+	Accrued interest and indexing on National Savings	2,932
+	Notes and coin in circulation	24,768	+	*Coin in circulation*	*2,472*
+	Other	496	+	Other	496
=	**Total central government gross debt**	**403,281**	=	***Total central government gross debt***	***394,343***

Annex
Notes and definitions[1]

The national debt

The *national debt* represents the total liabilities of the National Loans Fund (NLF). *Market holdings* include holdings by local authorities and public corporations, but exclude holdings by other central government bodies (principally the funds of the National Investment and Loans Office, the Exchange Equalisation Account, government departments and the Issue Department of the Bank of England) and by the Banking Department of the Bank of England (together called 'official holders').

The national debt comprises:

British Government Securities (BGS): Sterling, marketable, interest-bearing securities issued by the UK Government. The nominal value of index-linked gilt-edged stocks is increased by the amount of accrued capital uplift. The whole nominal value of all issued stocks is recorded, even where outstanding instalments are due from market holders (where this is the case, the outstanding instalments are recorded as holdings of liquid assets). This article uses the same definition of short and medium-dated gilts as the National Loans Fund accounts (under five years and five-ten years, respectively). In the financing requirement, however, and in general market usage, short-dated gilts are defined as three-seven years, and medium-dated as seven-fifteen years.

Treasury bills: Short-term instruments, generally with a maturity of 91 days. The bills, which can be traded on the secondary market, are sold at a discount and redeemed at par. The amount of discount depends on the price accepted by the Bank at the tender.

National Savings securities: Non-marketable debt, comprising a variety of products available to the public. The national debt excludes deposits in ordinary accounts of the National Savings Bank, as well as accrued interest and indexing on National Savings products.

IMF interest-free notes: Non-marketable non interest bearing Treasury notes, issued by the Bank on the authority of warrants from HM Treasury. The warrants authorise various sums to be placed at the disposal of the International Monetary Fund (IMF) as a reciprocal facility for loans received by the United Kingdom. All transactions are initiated by the IMF.

Certificates of tax deposit: Non-marketable debt available to taxpayers generally, which may be used in payment of most taxes.

Other sterling debt: Includes *ways and means advances* (the method by which government departments etc lend overnight to the NLF), *NILO stocks* (non-marketable stocks, issued directly to the National Debt Commissioners, whose terms reflect those on existing BGS), and the *temporary deposit facility* (deposits by central government bodies and public corporations with the NLF).

Foreign currency debt: Converted to sterling at end-period middle-market closing rates of exchange, and comprising *foreign currency bonds* (denominated in US$, DM and Ecu), *Ecu Treasury notes and bills*, *long-term post-war loans* from the governments of the United States and Canada and *assigned debt* (debt originally drawn under the Exchange Cover Scheme, and transferred to the government following privatisations of public corporations).

Central government gross debt

This includes *market holdings of national debt*, and also any market holdings of other central government gross debt, which comprises:

Net indebtedness to the Bank of England Banking Department: The Banking Department's holdings of central government debt (principally, sterling Treasury bills and British Government Securities) less its deposit liabilities to the National Loans Fund and Paymaster General. Where this is a net claim, it is recorded in the accounts as a liquid asset (and so does not contribute towards gross debt).

National Savings ordinary account, accrued interest and indexing on National Savings: Excluded from market holdings of national debt.

Notes and coin in circulation: Excludes holdings by the Banking Department of the Bank of England, which are subsumed within the figure for 'Net indebtedness'.

Other central government gross debt: Comprises market holdings of *Northern Ireland government debt* (principally, Ulster Savings Certificates), *bank and building society lending* and the *balances of certain public corporations with the Paymaster General*.

Public sector consolidated gross debt

This includes *central government gross debt*, as well as *all local authority and public corporation debt*. All holdings of each other's debt by these three parts of the public sector are netted off to produce a consolidated total.

(1) These notes and definitions (along with the data in this article) are in line with the method used for compiling the UK National Accounts prior to September 1998. The accounting standards used now (ESA95) have changed some of the definitions. These are discussed in the box on pages 334–35.

The local authorities sector comprises all bodies required to make returns under the various local authorities acts. Public corporations are trading bodies (including nationalised industries), which have a substantial degree of independence from the public authority that created them, including the power to borrow and maintain reserves. For further details, see Chapter 4 of the *Financial Statistics Explanatory Handbook*, published by the Office for National Statistics.

Public sector net debt

The public sector net debt is derived from the consolidated debt of the public sector, by deducting the public sector's holdings of liquid assets.

General government consolidated gross debt (GGCGD)

This is central government and local authorities' gross debt, with holdings of each other's debt netted off to produce a consolidated total. The Maastricht measure of GGCGD is calculated on the European System of National and Regional Accounts (ESA) basis, which differs slightly from the UK National Accounts definition. In accordance with the ESA, IMF interest-free notes are excluded from the calculation of general government debt, but as a liability of the National Loans Fund, they are included in the other measures of government debt used in this article. There are other miscellaneous instruments that are included in government debt on an ESA basis, but excluded on a domestic basis.

Inflation and growth in a service economy

By DeAnne Julius, member of the Bank's Monetary Policy Committee and John Butler of the Bank's Conjunctural Assessment and Projections Division.

This article sets out the initial findings of a project team set up by the Bank to examine the behaviour of the service sector, in the light of the increasingly important role that services play in the UK economy, and so in achieving the Government's inflation target. It presents a series of stylised facts about the service sector between 1970–97, and notes areas for further work.

Introduction

Late in 1997, the Bank set up a project team(1) on the service sector, which aimed to develop a fuller understanding of how the sector operates. The project has drawn on work by others, both from this country and abroad. It tries to reach comprehensive and aggregate conclusions where possible, while still recognising the critical diversity within the huge UK service sector. Through the Bank's network of regional Agents, the project team has also benefited from discussions with many service businesses. These initial findings are primarily descriptive and backward-looking, typically covering the period 1970–97, or as much of it as the relevant data series allow.(2) They quantify the growing role of services in the UK economy, and identify the key differences revealed by the data between the behaviour of services and the rest of the economy.

A key feature of the UK economy during the current recovery, particularly over the past 18 months, has been the difference in performance between the buoyant service sector and the slowing manufacturing sector. Some commentators have called this a 'two-speed' economy. Since the start of the recovery in 1992, the rate of output growth in the service sector has been more than double that of manufacturing; more than 80% of the rise in UK employment has been generated by service industries; and in 1997, the UK economy recorded its first current account surplus for twelve years, partly accounted for by a record surplus in the trade of services. For most of this period, the inflation rate of services has been higher than that of goods.

These trends are not new, nor are they unique to the United Kingdom. The share of the service sector in both production and employment has been growing for at least two decades in most OECD countries. Services now account for two thirds of UK GDP, and three quarters of employees are engaged in providing services. It is in this sense that the United Kingdom can be regarded as a service economy. This predominance of service industries raises important issues for policy-makers.

First, it is unclear whether the economic characteristics of services are similar enough to those of goods for conventional macroeconomic constructs (such as the output gap) to be operationally useful for policy-makers. And if it is harder to measure quality or productivity improvements in services than in goods, economy-wide measures of growth and inflation will become increasingly distorted. This will complicate the policy-makers' job.

Second, a policy decision (say, to change interest rates) may affect the economy differently when most producers are service companies. Service producers may differ from other sectors of the economy in their export orientation and capital intensity, and so in their sensitivity to changes in exchange rates and interest rates. This may affect the optimal policy choice.

Third, some of the new service industries may have special economic properties that do not fit well with the assumptions of conventional economic models. For example, telephony and computer software production have high initial costs, but very low marginal costs. As a result, pricing strategies may be complex, and component services are sometimes embedded in customised packages that can obscure the price actually paid or the service actually bought. IT-based services are already a major wealth-producer and job-creator (and, currently, an area of skill shortages), and are likely to be one of the fastest-growing parts of the economy in the next decade. A better understanding of their role in UK growth and inflation is needed.

The structure of the article is as follows. Each section begins with bullet points that summarise the key stylised facts from that section. The second section compares service sector growth in the United Kingdom with other countries, and considers its cyclicality. The third section gives estimates of the size of the linkages between the service sector and the rest of the economy. The fourth and fifth sections discuss service sector investment, employment

(1) The other members of the project team were Alan Beattie, Andrew Hauser, Caroline Webb and Simon Whitaker; all contributed substantially to the work on which this article is based.
(2) The analysis is based wherever possible on the latest data from the Office for National Statistics (ONS), which incorporate the changes made to the National Accounts in September 1998. Details of these changes are given in the article on pages 361–67 and in the November 1998 *Inflation Report*.

and productivity. The sixth section covers international trade in services. The seventh section reviews the share of services in consumption and the behaviour of service sector prices in RPIX inflation,(1) and the final section notes a number of issues that could be pursued in further work.

Service sector output growth and cyclicality

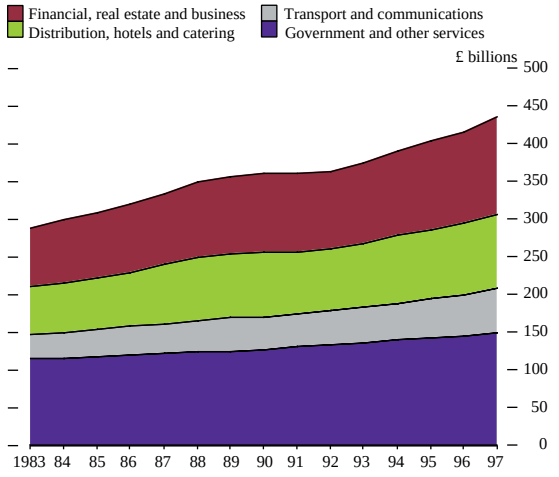
- *Although the share of service sector output has grown in most developed economies in the past 15 years, the increase has been more pronounced in the United Kingdom.*

- *Production of marketed services has expanded strongly for more than 25 years.*

- *The degree of volatility in service sector output varies across industries, and depends on the source of shocks. But there is no clear evidence to support the hypothesis that as the UK economy becomes more service-oriented, the business cycle will become smoother.*

The ONS's broadest definition of service sector output corresponds to the non-tangible, non-commodity notion—everything except agriculture, mining, construction and manufacturing. Within this, the four broad categories of services set out in the national accounts are: Distribution, hotels and catering (DHC); Transport and communications (T&C); Finance, real estate and business services (FRB); and government and other services (GOV).(2) Chart 1 gives an idea of the relative size of each of the sectors. The first three categories are typically referred to as marketed services, and the fourth category is predominantly made up of non-marketed government services such as health, education and defence, though it includes a small amount of marketed services.

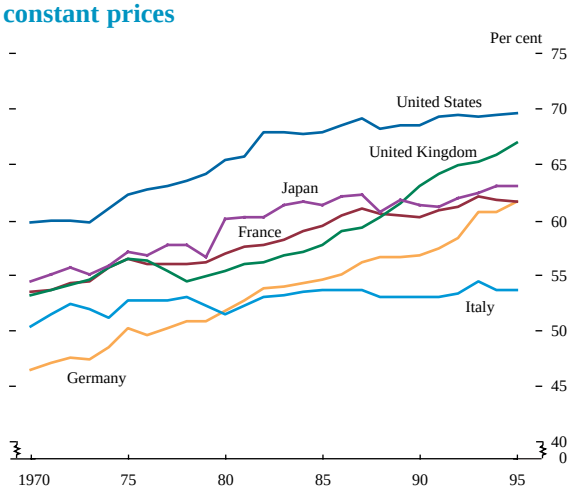
Chart 1
Real service sector output



In 1970, service sector industries supplied 53% of GDP (at constant 1995 prices); in 1995, this had grown to 67%.

The share of marketed services in GDP grew from 42% in 1970 to more than 55% in 1995. As Chart 2 illustrates, this gradual shift in output share was not unique to the United Kingdom, but occurred in most of the major industrialised economies. However, the United Kingdom now has the second-highest relative share among the G7 countries (behind the United States), and in the past 15 years, the share of services' output has grown more rapidly in the United Kingdom than in the United States, where it appears to have levelled off at around 70%.

Chart 2
Service sector output as a share of GDP in constant prices



Source: OECD, 1996 International Service Statistics.

Services have grown much more rapidly than the rest of the UK economy throughout the period 1970–97: the average yearly rates of growth for the service and manufacturing sectors were 2.6% and 0.7% respectively. Marketed services have grown at a yearly rate of around 3% during the same period. Growth has been particularly rapid in financial services, business services, real estate activities, education and health services, and communications, including entirely new industries such as computer software and cellular telephony.

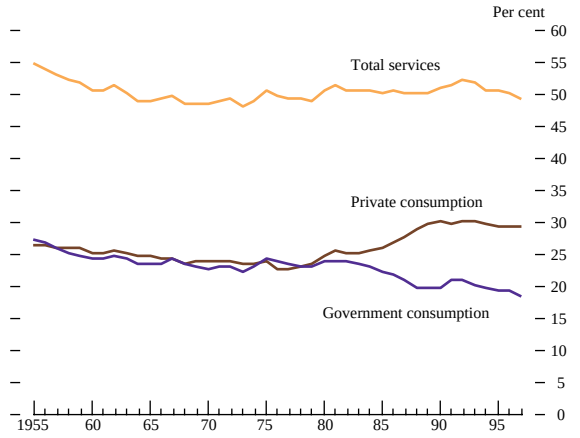
The importance of services may also be gauged by expenditure on them as a share of GDP. The expenditure share is measured by the ratio of consumption expenditure on services (both private and governmental) plus the net trade balance in services to GDP at constant 1995 market prices. The expenditure share has changed much less than the output share (see Chart 3). From 1970–97, it varies between 48% and 52%. From 1970–92, there was a slow upward trend, but since 1992 the share has fallen. The main reason is offsetting movements in private and government consumption. Consumption of services is rising as a proportion of private consumption, and the latter is rising as a proportion of GDP. But consumption of government services has been falling as a proportion of GDP since 1981.

The output share and the expenditure share differ by the extent to which service industries produce for intermediate

(1) Inflation measured by the retail price index excluding mortgage interest payments.
(2) The utilities—gas, electricity and water—are placed in the production sector along with manufacturing, mining and construction, although consumer expenditure on utilities is counted as services.

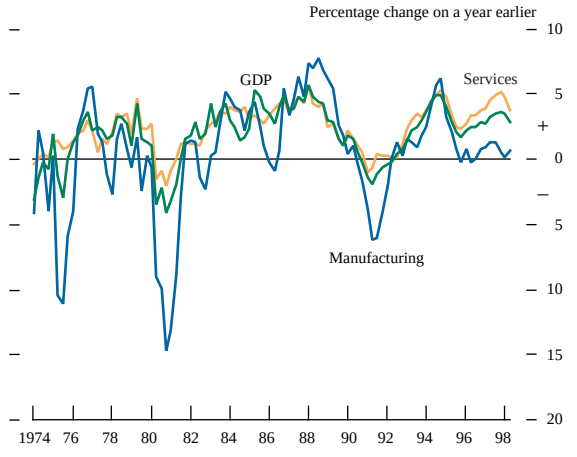
output rather than for final demand. The relatively modest rise in the expenditure share is explained by the fact that much of the expansion of services output has been in business services and, to a lesser extent, in distribution.

Chart 3
Expenditure on services as a proportion of GDP (1995 prices)



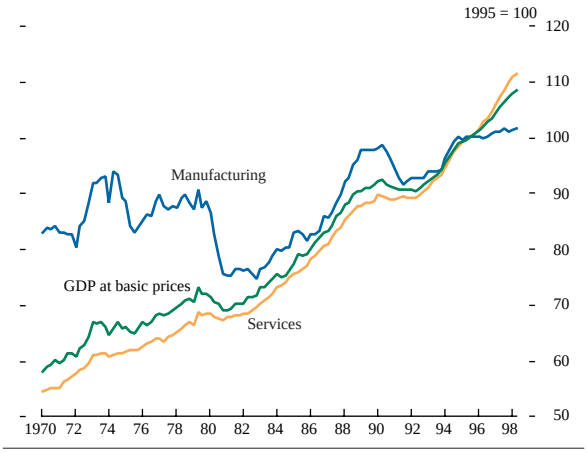
A key issue of debate at present is whether the gradual shift from manufacturing towards services will smooth the UK business cycle: whether expansions will become longer, and recessions become shorter and shallower. This debate typically highlights differences in stock behaviour, exposure to international demand fluctuations and capital intensities between the two sectors. Charts 4 and 5 show that services were considerably less cyclical than manufacturing during the two most recent complete cycles (1973 Q3 to 1980 Q1, and 1980 Q2 to 1990 Q4), with less-pronounced peaks and

Chart 4
Annual growth in output



troughs, as well as fewer cycles. The manufacturing sector went into recession almost two years before the economy as a whole followed in 1980, whereas the service sector continued to expand in the early 1970s and contracted considerably less at the end of the decade. But it is important to note the specific factors behind the 1970s

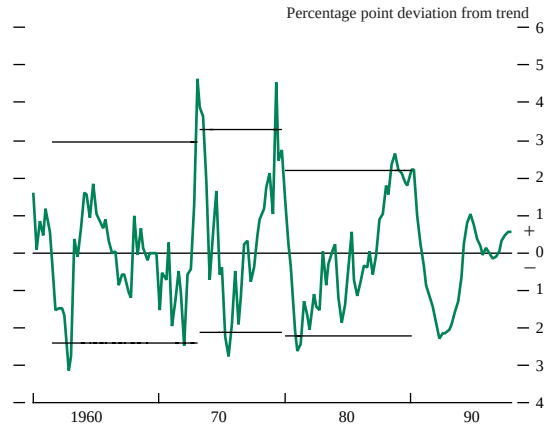
Chart 5
Levels of output



contractions—in particular, the oil shocks and real sterling exchange rate appreciation, which affected manufacturing more significantly and persistently than services, and led to a structural as well as a cyclical response.

A more systematic statistical analysis of the entire post-1960 period(1) suggests that the 1970s contractions in total output may have been atypical. Chart 6 plots the deviation of aggregate output, as measured by GDP in 1995 basic prices, from its trend during the most recent three complete cycles. There is no evidence to suggest that the business cycle has progressively become smoother, or that expansions have become longer and recessions shorter since 1960. This is consistent with findings in the United States.(2) Moreover, during the 1960s and the most recent cycle, the service and manufacturing cycles have been in phase, entering recession at virtually the same time, and with the depth and duration of both cycles much more alike than in the 1970s. But the performance of services and manufacturing has differed again during the most recent recovery, with the service sector benefiting from

Chart 6
Volatility pattern in the business cycle



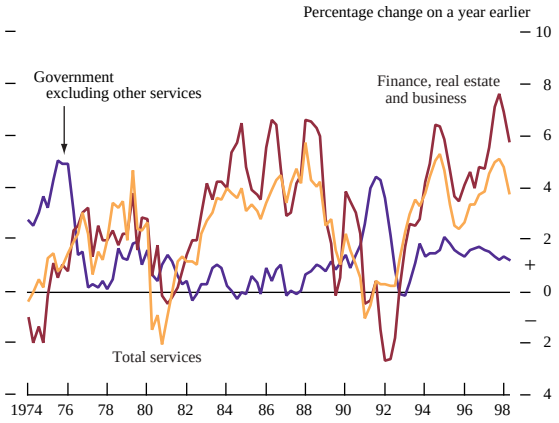
Note: Volatility is measured as a percentage point deviation of GDP at basic prices from its Hodrick-Prescott trend (with smoothing parameter 1600). Bands are 90% regions for the past three business cycles: 1961 Q4 to 1973 Q2, 1973 Q3 to 1980 Q1, and 1980 Q2 to 1990 Q4.

(1) The period when the share of services in the UK economy increased; from 1945–60, its share was fairly stable at 47%.
(2) 'Cyclical Implications of the Declining Manufacturing Employment Share', Andrew Filardo, *Economic Review*, 1997 Q2.

strong domestic demand, while the performance of manufacturing has been constrained by sterling's sharp appreciation.

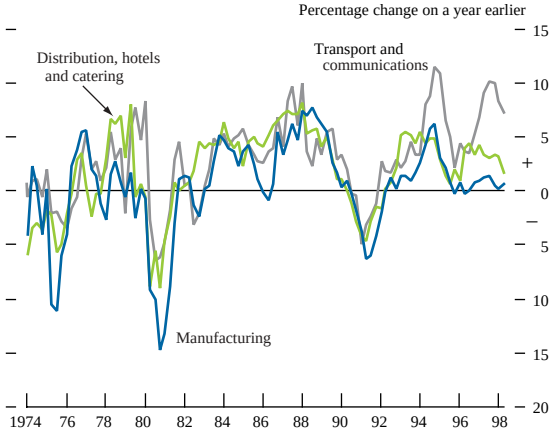
Within the service sector, different industries have differing cyclical patterns (see Charts 7 and 8). Both the T&C and DHC sectors appear as cyclical as manufacturing. There is some evidence to suggest that government services are, if anything, counter-cyclical. Cycles in FRB have been swamped by its rapid expansion, due to a sequence of structural changes. FRB services entered recession in 1991 for the first time in more than 20 years.

Chart 7
Annual growth in output



Note: For 1974–82, Finance, real estate and business output is estimated.

Chart 8
Annual growth in output



Linkages and multipliers

- *The service sector is becoming a more important source of inputs to non service sector production.*

- *A unit increase in demand for either service sector or manufacturing output affects whole-economy output to the same extent.*

Most sectors within the economy are closely interconnected, but use of ONS input/output (I/O) tables allows us to disentangle the connections. This analysis highlights the growing importance of services as inputs to production. Services used as inputs to production of both goods and services increased substantially between 1984–90. For example, the proportion of inputs required by the non service sectors from the service sector increased by around 15% in the six-year period. Although some of this change will reflect the sectoral reclassification of activities resulting from outsourcing (many manufacturers are now purchasing services that they once produced themselves), the change is probably also associated with efficiency gains and increases in requirements for a wide range of services, such as communications, finance, insurance, and real estate.

The 1990 I/O tables also estimate the direct and indirect result on the economy of a unit change in the final demand for a commodity—the output multiplier (see Table A). This suggests that if the direct demand for marketed service sector output increased by 100 units, overall economic output would increase by 174 units. This is only marginally less than the impact of a similar increase in demand for manufactured goods.(1)

Table A
Direct and indirect impact on economy of a 100-unit change in final demand for a particular sector's commodity

Commodity	Final impact on economy (units)
Marketed services	174
Non-marketed services	126
Manufacturing	180
Primary sectors	197

Source: Calculated from 1990 I/O tables.

Service sector investment

- *Investment intensity of the private service sector (the investment-output ratio) is rising, and is now above that of manufacturing. So the capital/output ratio is catching up with that of manufacturing.*(2)

- *Across the OECD, both the capital/labour ratio and total factor productivity growth have been rising more slowly in private services than in manufacturing.*

The private service sector accounts for a growing share of whole-economy investment. This could simply reflect its larger share in the economy. But the private service sector is also investing a greater share of its output—its investment intensity is rising (see Chart 9).(3)

The rising trend in investment intensity has been accounted for by the sectors of DHC and FRB services (see Chart 10). In the financial sector, there is an increasing reliance on

(1) The Leontief inverse provides the link between commodity output and final demand. An increase in demand for commodity *i* of *x* units would lead to a direct increase of *x* units in the output of commodity *i*. However, commodities *j* and *k* may also be needed in the production of commodity *i*, which may in turn require a certain amount of commodity *i*, *j* and *k* to produce it. So there will be a further indirect increase in the demand for commodity *i*.
(2) Private service sector investment excludes investment in dwellings and investment by government.
(3) Investment intensities in Charts 9 and 10 and the capital/output ratios in Chart 11 are calculated from unrevised ONS data, since full back-data on the revised basis are not yet available. This is not expected to affect the conclusions.

information technology (IT) in the provision of services. IT is also becoming more important in the DHC sector, as a complement to 'just-in-time' production processes. The investment intensity of the T&C sector is currently lower than in the late 1960s, when much infrastructure was initially set up, but has also been on a rising trend since the early 1980s.

Chart 9
Investment intensity (I/Y)

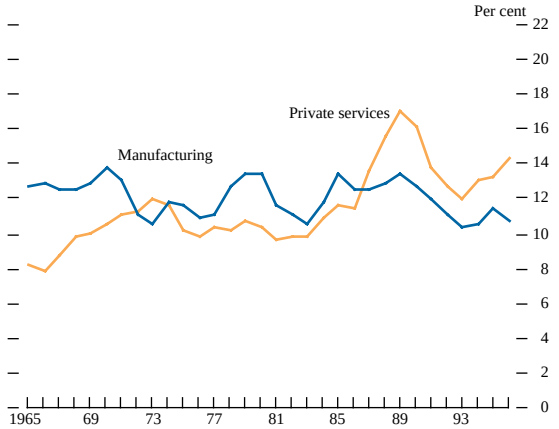
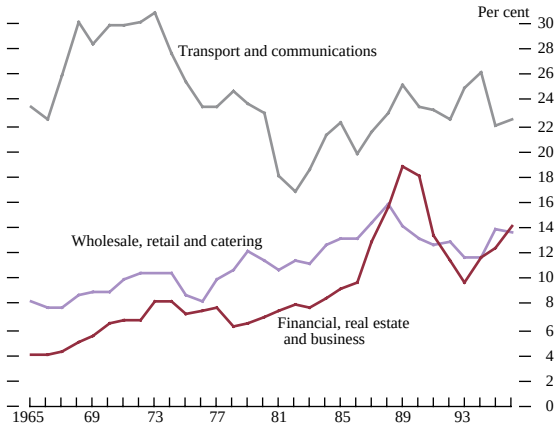


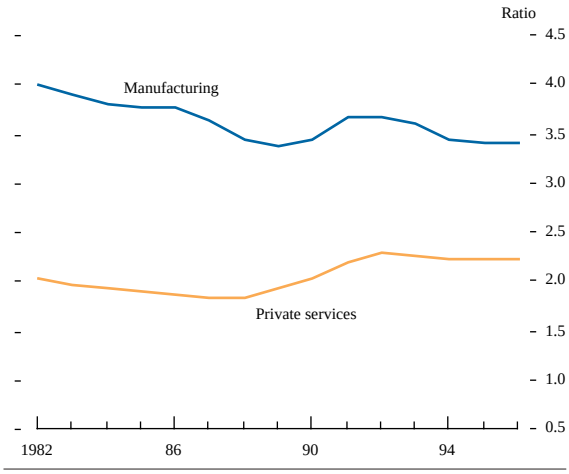
Chart 10
Investment intensity (I/Y)



The capital/output ratio of the manufacturing sector has been higher than in the private service sector (see Chart 11). The capital/labour ratio is also much higher and has risen more rapidly in the manufacturing sector than in the private service sector, as manufacturing has to date been more amenable to automation. Rising capital/labour ratios have been associated with technological change; this has led to positive total factor productivity growth in manufacturing in the United Kingdom and in other OECD economies. Total factor productivity growth has been much slower in the private service sector.(1)

The increasing importance of the service sector has implications for measuring the incentives to invest in fixed capital. One measure is the ratio of the market value of a firm to the replacement cost of its capital stock, namely 'Tobin's *q*'. When this ratio exceeds one (ignoring tax effects), the firm can increase its value by issuing liabilities and buying more fixed capital. But this is a valid measure of the incentive to invest in fixed capital only when the market valuation relates to fixed assets alone. For many service sector firms, and increasingly for manufacturers, intangible assets account for a large part of a firm's market value. Because they are not included in the denominator of Tobin's *q*, this measure increasingly tends to overstate the incentive to invest in fixed capital or, taking another perspective, gives an increasingly misleading indicator of whether the stock market is overvalued.(2)

Chart 11
Capital/output ratio



Service sector employment and labour productivity

- *The share of employment accounted for by the service sector has been rising since 1970, with much of the growth coming from business and education and welfare services.*
- *Labour productivity growth in services appears to have been markedly lower (and less cyclical) than in manufacturing, though some of this may be caused by mismeasurement.*
- *International differences in whole-economy productivity growth have largely been driven by the relative performance of service sectors.*

Though the total of UK employee jobs was almost unchanged from 1970–97, the number of employee jobs in service industries grew by about five million. Service industries accounted for around 72% of total UK employee jobs in 1992, compared with 54% in 1970, with some of this

(1) 'Productivity convergence in OECD service industries', Gouyette and Perelman, in *Structural Change and Economic Dynamics* (1997).
(2) See the *Inflation Report*, November 1997, page 24.

increase probably caused by the contracting-out of services by manufacturing. But this trend appears to have flattened after 1992, and the service sector share rose only slowly to 76% by 1996, before falling in 1997 for the first time since the 1970s, though the service sector continued to grow more rapidly than the rest of the economy. The service sector's share of self-employment has remained at around 60% since the late 1970s, but there has been a shift within this share away from wholesale and retail trade, and towards FRB services.

The demarcation between service and manufacturing employment is hazy, since the industrial and occupational definitions overlap. For example, a marketing worker employed by a pharmaceutical company could be seen as having a services occupation, but in the industrial sector of manufacturing. Occupational employee data for 1997 suggest that around 1.5 million manufacturing jobs were more like service sector jobs and 1.4 million *vice versa*. Because of the relative size of the two sectors, a much higher proportion (around one third) of the manufacturing sector comprised service sector-type jobs than the other way round. But even if employment were reclassified on an occupational basis, the service sector would not be much larger than as currently measured.

Areas where employee jobs have increased have been reasonably consistent since 1970. The fastest-growing sectors were the private business sectors of banking, finance, insurance and business services, and the welfare services of education and health. Employee jobs in public administration grew slowly in the 1970s and fell thereafter; employee jobs in T&C trended downwards during the period, though this may have flattened recently (see Table B).

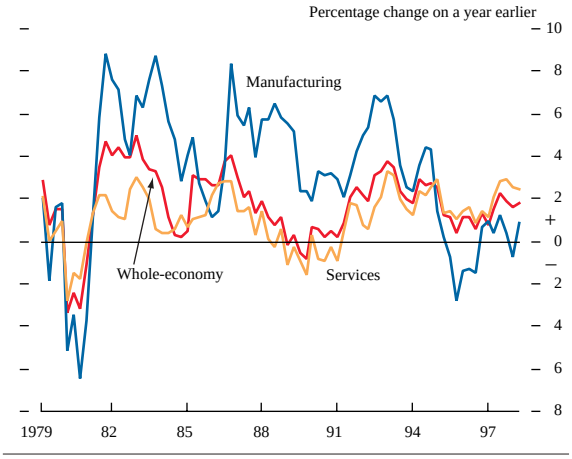
Table B
Employee jobs, by sector and major industry groups

	Average percentage change 1980–97	Thousands 1980	1990	1997
Manufacturing sector	-2.7	6,311	4,605	4,001
All services	1.2	13,842	15,974	16,893
Service industries:				
Distribution, hotels and catering	1.0	4,354	4,816	5,116
Business services and finance	2.9	2,418	3,440	3,909
Transport, storage and communications	-0.6	1,467	1,371	1,306
Government and other services	1.0	5,604	6,347	6,562
Services as share of employee total (per cent)		61.6	71.4	76.0
Services *excluding government* as share of employee total (per cent)		40.0	47.0	51.0
Manufacturing share of employee total (per cent)		28.1	20.6	18.0

Labour productivity growth on a per worker basis in manufacturing can be compared with that in services for the period 1979–97 (see Chart 12). Productivity growth in the service sector was generally lower than in manufacturing. Non-manufacturing productivity also appears to have been less volatile than manufacturing, suggesting that the greater variance of manufacturing output is not completely offset by comparatively higher swings in employment.

International estimates of relative productivity have often concentrated on manufacturing sector productivity levels and growth, not least because they are easier to estimate and because manufactured goods tend to be traded internationally more than services. But long-run estimates of sectoral productivity suggest that changes in service sector productivity have accounted for a large proportion of the changes in relative whole-economy labour productivity growth between the United Kingdom, United States and Germany. This has also been true of total factor productivity, implying that different capital/labour ratios across countries were not the cause. Microeconomic studies of the same subsets of the service sector (such as commercial banking) in different countries confirm that there are substantial international differences in labour productivity levels.

Chart 12
Annual labour productivity growth



Within the service sector, only the T&C sub-sector—where there has been a net loss of jobs in the period—has had average annual labour productivity growth of more than 1% during the past 10–15 years. Bank of England estimates of labour productivity at a more disaggregated level in the past ten years suggest that mismeasurement may be a problem. A number of private service industries have had implausibly low or even negative productivity growth. For example, between 1986–95, productivity on an 'hours worked' basis fell in hotels and catering in seven years, of which five were consecutive; in business services and real estate, it fell in five years; and in wholesale and retail trade, in three. Mismeasurement may be particularly acute in the FRB sector.

Service sector trade and foreign direct investment

- *Services are less extensively traded internationally than goods. This can be explained partly by the need of many services to maintain a local commercial presence, so that international competition operates via foreign direct investment rather than trade.*

- *As a proportion of gross trade flows, services have become less important in the past 30 years. The UK*

the value share of world service exports has fallen, but increasing openness of the economy to trade means that service trade has risen as a proportion of GDP.

- *The UK has a comparative advantage in services: the trade in services has consistently been in surplus, compared with a significant deficit in the trade in goods.*
- *The most important components of the UK service trade are financial and business services (which account for all of the overall surplus) and travel (a significant deficit item).*
- *Europe is the United Kingdom's largest trading partner for both goods and services, but the United States (with which the United Kingdom has significant services surpluses) is considerably more important for services than for goods trade.*

Services are less widely traded than goods on international markets. Exports contributed only 20% of value-added in the private service sector in 1990, compared with 42% in the production sectors (see Table C). But since the share of services in GDP is nearly three times that of manufacturing, service exports contribute more than 40% of total UK value-added from exports.

Table C
Export and import propensity by sector (1990)

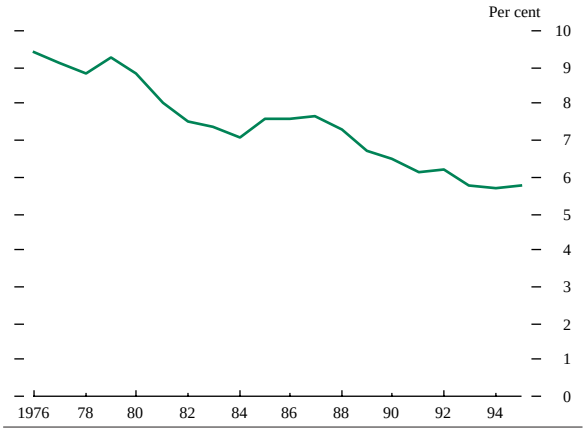
	Imports as percentage of domestic sales + imports	Percentage of sectoral value-added due to exports	Total sectoral export value-added as percentage of GDP
Production sectors	*33.8*	*42.4*	*10.7*
Total services	4.2	12.8	8.5
of which:			
Private services	5.4	20.4	8.0
of which:			
Transport and communications	12.1	25.8	2.1
Business services and finance	4.7	21.0	3.4
Distribution, hotels and catering; repairs	3.1	16.6	2.4
Public services	1.4	1.8	0.5
Whole economy	15.0	19.6	19.6

Services firms are more likely than manufacturers to establish an overseas presence via foreign direct investment (FDI). Inward and outward FDI stocks of services account for some 40% of total UK FDI stocks, nearly twice the share of services in UK trade. In value terms, services FDI flows are considerably smaller than services trade. Average inward and outward FDI flows between 1991–94 were £9.2 billion, compared with £68.8 billion for average exports and imports in the same period. However, the real significance of overseas markets served via outward FDI is better reflected by the continuing stream of foreign sales by British firms in the host countries than by the initial investment itself recorded as FDI in the balance of payments.

The lower volume of trade in services can also be partly explained by politics. The barriers to services trade remain considerably higher than those to trade in goods. These institutional barriers to trade in services are gradually being removed, for example as a result of the successful conclusion of the Uruguay round, while technological developments have expanded the scope for trade in some services. Consequently, world trade in services has been growing faster than world trade in goods. OECD trade in services (exports + imports) grew at an annual rate of 8.6% between 1980–90, compared with 6.7% for goods. Nonetheless, services trade accounted for only 22% of total OECD trade in 1992.

As a share of gross UK trade, services have become less important in the past 30 years.(1) Combined with the rising share of services in OECD trade, this means that, in value terms, the United Kingdom has been losing market share (see Chart 13), as other G7 economies have been converging towards the United Kingdom's higher share of services in total trade. Despite this, the United Kingdom

Chart 13
UK share of world services exports (value terms)



appears to have a comparative advantage in services. The trade surplus in services for the last 30 years contrasts with the consistent trade deficit in goods (see Chart 14). The largest component of the UK service trade is FRB services. This category accounts for more than 40% of total service exports, and all of the overall surplus.

Chart 14
Quarterly balance of trade

(1) This trend is evident in both exports and imports, and remains when the data are recast in volume terms.

Consumption of services and prices

- *The share of services in consumption, and consequently in the retail price index (RPI), increased sharply in the 1980s. Thereafter, the share has been stable at around 46%.*

- *Service price inflation, on the RPI measure, has been on average 2 percentage points higher than goods price inflation since 1988.*

Consumption of services made up 46% of total household consumption expenditure in 1997. The services share fell in the 1950s and 1960s, stabilised in the 1970s, and then increased sharply again in the 1980s following the liberalisation of financial services (see Chart 15). Since 1989, it has stabilised again.

At the retail level, the share of services in total sales has risen only moderately over time. The retail price index (RPI) measures price movements in a typical consumer's basket of goods and services. Services made up around 35% of the RPI in 1997, compared with 30% ten years ago.(1)

Chart 15
Services as a proportion of consumption expenditure (1995 prices)

The Government's target for retail price inflation excluding mortgage interest payments (RPIX) is 2.5% per year. Since 1977, retail price inflation for services has been around 2 percentage points higher than that for goods in the United Kingdom (see Chart 16). There are relatively few examples, for only short periods, where retail goods inflation has been higher than service inflation. This result is consistent across countries—Chart 17 shows the difference between retail goods and service inflation rates for the United Kingdom, United States, Japan, France and Germany since 1981. In the United Kingdom, the wedge between goods and service price inflation is now half its long-run average, partly because average inflation has come down, but also because of falling utilities prices since the privatisation of a number of industries (see Chart 18).

Chart 16
Retail goods and service price inflation

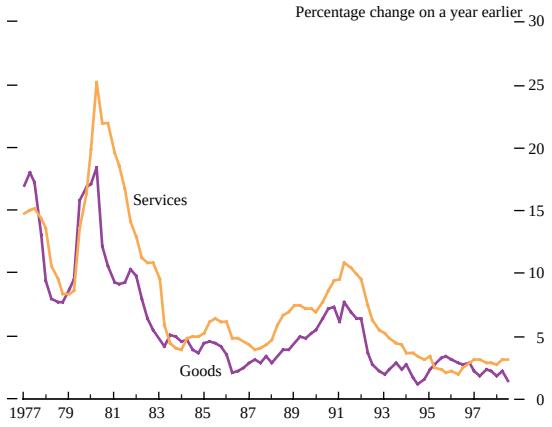


Chart 17
Goods price inflation minus service price inflation

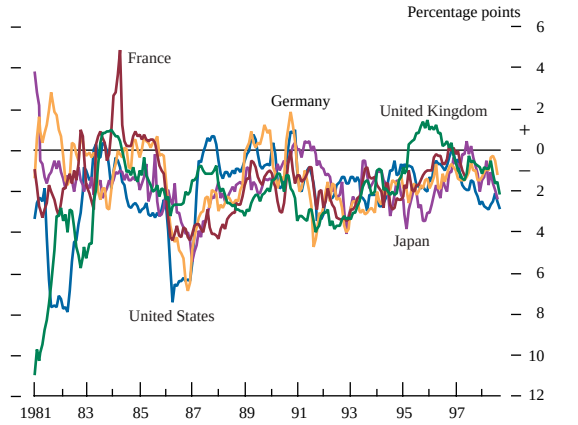
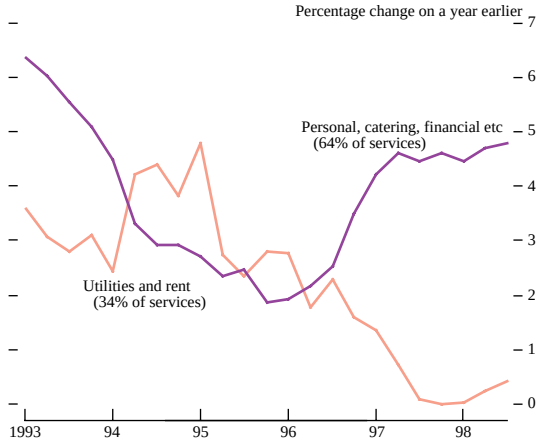


Chart 18
Service price inflation



There are at least five possible explanations for the general differential between goods and services price inflation. First, there could be systematically greater measurement bias for services than for goods, in terms of underestimating

(1) The share of services in the RPI is lower than in household consumption mainly because the RPI excludes the imputed rent of owner occupiers, a service.

quality improvements for which the consumer is willing to pay, thereby overstating the price increase and understating the quantity increase. Second, the lower exposure of services to international trade may create less incentive to innovate and improve productivity growth. So service prices will continue to rise relative to goods. Third, the same will occur if average productivity growth is intrinsically faster in manufacturing than services. Fourth, international competition may be increasing at a faster rate for goods than for services, leading to a more rapid erosion of manufacturers' margins. Fifth, even if competitive pressures are equally strong, there may be certain characteristics of some services that allow more price complexity, and therefore market power, by producers. Customisation (versus commoditisation) and direct interaction between the producer and consumer (versus arm's-length sales through intermediaries) make price comparisons more difficult for consumers. These factors could also cause service prices to rise more rapidly than goods prices, at least over a transitional period.

Conclusions

With the growing significance of the service sector in the UK economy, it becomes increasingly important to understand how the sector behaves, not least because of its potential impact on inflation, and in achieving the inflation target set by the Government. But less is still known about services than about the manufacturing sector. The initial findings of the Bank's project team, described in this article, give rise to a number of issues that might be followed up in further work, by either the Bank or others. In particular:

- *Why is measured service sector inflation consistently higher than goods inflation? Which of the alternative hypotheses accounts for the difference, and what does that imply for the definition of the inflation target?*

- *Are service sector output and trade flows more or less sensitive to shocks transmitted through the exchange rate and/or interest rates than the remainder of the economy?*

- *Are data mismeasurement problems likely to be more serious in the service sector than in manufacturing? Does this have implications for measured service sector inflation, output and productivity growth?*

- *What additional survey or official data on the service sector could best contribute to understanding and monitoring its structural and cyclical output and price behaviour?*

The foreign exchange and over-the-counter derivatives markets in the United Kingdom

By Jamie Thom of the Bank's Foreign Exchange Division and Jill Paterson and Louise Boustani of the Bank's Markets and Trading Systems Division.

In April this year, the Bank of England conducted its regular survey of turnover in the United Kingdom foreign exchange and over-the-counter (OTC) derivatives markets,(1) *as part of the latest worldwide survey organised by the Bank for International Settlements (BIS). The foreign exchange market survey has been conducted triennially since 1986, and a parallel survey of the OTC derivatives markets was first conducted in 1995. This article sets out the results (in US$ billion), and compares them with the 1995 survey and results for other major centres.*(2)

The survey shows that:

- *Average daily spot and forward foreign exchange turnover for April 1998 was $637 billion, 37% higher than the $464 billion per day recorded three years earlier (an annualised growth rate of 11%).*

- *Average daily turnover in the United Kingdom for OTC currency and interest rate derivatives was $171 billion, 131% higher than the $74 billion per day recorded three years earlier (an annualised growth rate of 32%).*

- *The United Kingdom has consolidated its position as the world's largest centre for foreign exchange and OTC derivatives business, accounting for 32% and 36% of the global foreign exchange and OTC derivatives markets respectively.*

- *The forward foreign exchange market continued to grow more rapidly than the spot market, which now represents only 35% of total foreign exchange turnover.*

- *US dollar/Deutsche Mark retained its position as the most widely traded currency pair (22% of all spot and forward foreign exchange transactions). The share of sterling trading rose, and sterling/US dollar regained its position as the second most actively traded currency pair (14% of turnover). Cross-trading of ERM currencies generally declined.*

- *The proportion of interest rate OTC derivatives turnover accounted for by swaps increased from 32% to 56%; the proportion accounted for by forward rate agreements (FRAs) fell from 59% to 35%.*

- *ERM currencies dominated the UK interest rate derivatives market, making up 56% of all trades. The Deutsche Mark almost doubled its share of the market, growing from 18% to 32%; all other*

Introduction

The Bank's foreign exchange and derivatives market surveys in April were the latest in a triennial series co-ordinated globally by the BIS. On this occasion, 43 countries undertook market surveys, and have each reported their results to the BIS, which has produced estimates of the size of the global markets.(3) These global

(1) Only interest rate and currency OTC derivatives were covered by the 1998 turnover survey.
(2) Unless specified otherwise, turnover figures published here are adjusted to remove double-counting of trades between UK principals that will have been reported by both parties.
(3) Preliminary figures were released on 19 October 1998 and can be obtained from www.bis.org/press/p981019.htm.

The London survey

Participants

293 banks and securities houses participated in the UK foreign exchange survey (40 with nil returns, ie reporting 'no activity' in April), and 10 foreign exchange brokers. 317 principals took part in the OTC derivatives markets survey (120 with nil returns). As in previous years, the Bank of England asked all banks active in the United Kingdom, and some non-bank financial firms believed to be active in the wholesale markets, to participate in the survey. Other institutions did not take part directly, but their transactions with principals taking part, or through brokers, will have been reported by those institutions. It is reasonable to assume that little trading took place between non-participating entities.

The questionnaire

Survey participants were requested to complete a questionnaire prepared by the Bank of England, based on a standard format agreed with other central banks and produced by the Bank for International Settlements (BIS). Participants were asked to provide details of their gross turnover for the 20 business days in April 1998. Gross turnover is the absolute total value (measured in nominal terms) of all deals contracted; there was no netting of purchases against sales. Data were requested in terms of US dollar equivalents. The basis of reporting was the location of the trade, regardless of where it was booked. The questionnaire asked for data broken down by currency, instrument and type of counterparty.

The survey distinguished the following types of transaction:

Foreign exchange

- *Spot transaction*: single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract, for value or delivery (cash settlement) within two business days—including same-day and next-day value transactions.

Forwards

- *Outright forward*: similar to a spot deal except that it is for value more than two business days after the deal was struck.

- *Foreign exchange swap*: transaction that involves the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed at the time of the conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a date further in the future at a rate agreed at the time of the contract (the forward leg). Only the unsettled forward part of the deal was reported, and the spot leg was *not* included as a spot transaction.

OTC derivatives

- *Currency swap*: contract that commits two counterparties to exchange streams of interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity.

- *Currency option*: option contract that gives the right to buy or sell a currency with another currency at a specified exchange rate, during a specified period or on a specified date. This category also includes exotic foreign exchange options, such as average rate options and barrier options.

- *Forward rate agreement (FRA)*: interest rate forward contract in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.

- *Interest rate swap*: agreement to exchange periodic payments related to interest rates on a single currency; can be fixed for floating, or floating for floating, based on different indices. This group includes swaps where the notional principal is amortised according to a fixed schedule, independent of interest rates.

- *Interest rate option*: option contract that gives the right to pay or receive a specific interest rate on a predetermined principal for a set period of time. This group includes options written on interest rate securities, interest rate warrants or swaptions and caps, floors, collars, corridors or other synthetic products created by the grouping of different options.

Reporting institutions were asked to distinguish between transactions with *banks and securities firms*, *other financial institutions* (all categories of financial institution other than banks or securities firms) and *non-financial customers*, in each case separating local and cross-border transactions (determined according to the location, rather than nationality, of the counterparty) to permit adjustment for double-counting. Additionally, participants in the foreign exchange survey were asked how much business was done through brokers—including that through automated dealing systems—and to indicate whether they operated netting arrangements (and if so, to provide details). Brokers were also asked how much of their business was done through their own branches and subsidiaries abroad.

The *gross* aggregate responses to the main sections of the questionnaire are reproduced in Tables M, N and O (at the end of this article).(1) The BIS intends to publish an analysis of the global survey results next spring. A survey of global outstanding positions in the derivative markets (measured at the end of June 1998) has also been undertaken, and results for this will be released by the BIS at the same time.

(1) These data can also be obtained in electronic form from the Bank's web site at www.bankofengland.co.uk/pr98100.htm.

results are adjusted for the fact that trades between participants in the surveys reporting to two different central banks will appear in both national surveys (local double-counting is deducted 'at source').

Foreign exchange

Daily turnover in the United Kingdom

Average daily turnover during April 1998 was $637 billion per day ($217 billion in the spot market and $420 billion in the forward market). This was 37% higher than in the previous survey in 1995, a slower rate of growth in dollar terms than the 60% increase reported between 1992 and 1995. However, there have been large exchange rate movements since 1995: in sterling terms, the overall growth was 32%, whereas in Deutsche Mark terms it was 80%.(1)

About 47% of firms taking part in the survey thought that the overall level of turnover during the survey period was normal; 5% considered it to be above normal; and 15% below normal. The remaining 33% did not comment.

Global turnover

Table A shows that average daily turnover in the UK market is almost as great as that of the United States, Japan and Singapore combined. The growth of turnover in the United States was marginally faster than in the United Kingdom, partly because of the slower growth of ERM cross-currency and Ecu-denominated trading (which represented 10% of UK turnover in 1995, double that in the United States). The slower growth reported by the Banque de France and the Bundesbank was largely because of a fall in both centres in Deutsche Mark/French franc turnover. Several centres, including Japan, Hong Kong, and Switzerland, reported a fall in foreign exchange turnover in dollar terms. In domestic currency terms, however, turnover in Japan and Switzerland rose by 45% and 25% respectively between 1995 and 1998.

Table A
Average daily foreign exchange turnover

US$ billions

	1992	1995	1998	Percentage change 1995–98
United Kingdom	291	464	637	37
United States	167	244	351	43
Japan	120	161	149	-8
Singapore	74	105	139	32
Germany	55	76	94	24
Switzerland	66	87	82	-5
Hong Kong	60	90	79	-13
France	33	58	72	24

It would be misleading simply to aggregate the individual results from countries to produce a figure for global turnover; this would double-count deals between centres. The BIS estimate of global turnover eliminates such double-counting and shows that global turnover was $1,490 billion per day in April 1998, an increase of 26% from $1,190 billion in April 1995. The United Kingdom's share of the global foreign exchange market continued to rise: it reached 32% in April 1998, compared with 30% in 1995, 27% in 1992, and 26% in 1989.

Types of transactions

Table B shows a further fall in the proportion of foreign exchange business transacted for spot value. Forward transactions made up 65% of total gross turnover, continuing the substantial rise since the first survey in 1986, when the share of forwards stood at 27%. Most of these transactions are swaps, in which neither counterparty assumes currency risk. They are closely linked to money-market deals (most are short-dated), and are often used to hedge currency risk and manage liquidity. A similar trend was evident in the United States, where the proportion of turnover accounted for by forwards rose from 45% to 58% between 1995 and 1998.

Table B
Proportion of gross foreign exchange turnover by transaction type

Per cent

	1992	1995	1998
Spot	52	41	35
Forward: outright	6	7	7
Forward: swaps	42	52	58
Maturity of forwards:			
Up to and for 7 days	33	42	51
7 days and up to and for 1 month	4	5	5
1 month and up to 6 months	10	6	4
3 months up to and for 1 year		6	4
Over 1 year	1	1	1

Note: Percentage shares have been rounded to the nearest whole number.

Currency composition

Table C shows that US dollar/Deutsche Mark retained its position as the most widely traded currency pair. Its share of currency trading has remained stable at around one fifth

Table C
Relative shares of total net turnover by currencies traded

Per cent

	1989	1992	1995	1998		
	Total	Total	Total	Spot	Forward	Total
£/US$	27	17	11	4	10	14
US$/DM	22	24	22	10	12	22
US$/¥	15	12	17	5	7	13
US$/SwFr	10	6	5	1	4	6
US$/FFr	2	3	5	1	4	5
US$/Can$	2	2	2	1	2	2
US$/Aus$	2	1	2	1	1	2
US$/Lit	2	n.a.	3	1	5	6
US$/Pta	n.a.	n.a.	2	0	2	2
US$/other ERM	n.a.	9	6	1	8	8
US$/other	7	3	4	1	5	7
£/DM	3	5	3	3	1	3
£/other	1	1	1	0	0	1
DM/¥	2	2	2	1	0	2
DM/other ERM	n.a.	4	6	2	1	3
Ecu-denominated	2	5	4	0	2	2
Other cross-currencies	3	4	3	2	2	4
Total	**100**	**100**	**100**	**34**	**66**	**100**

n.a. = not available.

Note: Percentage shares have been rounded to the nearest whole number.

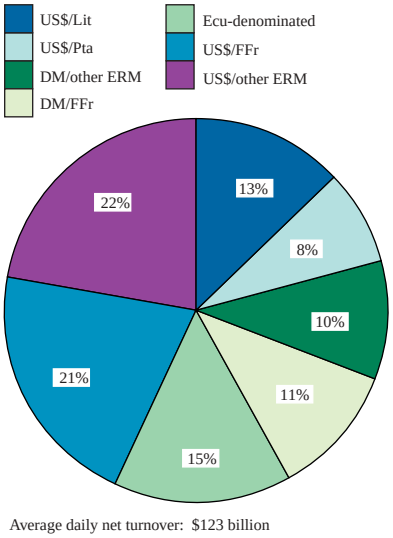
(1) In April 1995, the average rates of sterling and the Deutsche Mark against the US dollar were $1.61 and DM 1.38 respectively. In April 1998, the comparable figures were $1.67 and DM 1.81.

since 1986. The importance of US dollar/yen trading diminished, reversing a rise between 1992 and 1995. But the derivatives survey indicates that this currency pair now has the largest share of the currency options market; this may partly reflect higher expected volatility of the US dollar/yen exchange rate. Most activity in Japan was also in the options markets. For example, average daily US dollar/yen turnover fell in Japan, from $122 billion to $113 billion, but US dollar/yen volumes in the foreign exchange options market grew by more than 90% over the same period.

The proportion of UK turnover involving sterling increased slightly, from 16% to 18%, largely because of a rise in the share of sterling/US dollar transactions. But the importance of sterling trading to the UK market has declined significantly in the longer term (from 24% of turnover in 1992, and 27% in 1989). Overall, the UK market's reliance on domestic currency business is modest, compared with other major centres. In continental Europe, domestic currency trading represents a much higher proportion of total turnover: the figures for Germany, France and Switzerland are 66%, 41%, and 39% respectively.

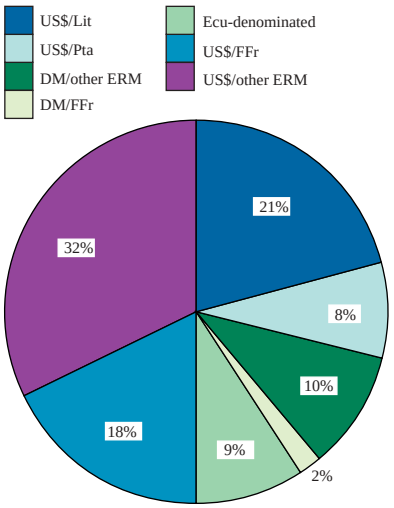
Cross-trading between ERM currencies generally declined, ahead of EMU. Table C illustrates that the proportion of total turnover attributable to trading the Deutsche Mark against other ERM currencies fell to 3%, from 6% in 1995. This was almost entirely attributable to a fall in Deutsche Mark/French franc business, from 3% of turnover to around ½%. Currency options business also declined: Deutsche Mark/French franc turnover as a proportion of total currency derivatives business fell from 5% to less than 1%. But Charts 1 and 2 show that the proportion of principals' turnover attributable to US dollar/ERM-currency trading increased (it is standard practice to swap non-dollar currencies using the US dollar as a conduit) and this may partly reflect the integration of national money markets within the prospective euro area.

Chart 1
ERM currencies in 1995



Average daily net turnover: $123 billion

Chart 2
ERM currencies in 1998



Average daily net turnover: $165 billion

Trading of the US dollar against 'other currencies' as a proportion of overall turnover increased to 7%, from 4% in 1995. The Federal Reserve Bank of New York reported an identical increase. This is consistent with more rapid growth of emerging market currency trading, relative to overall turnover. By way of background, Table D, reproduced from the BIS's 68th Annual Report, shows that local daily turnover in emerging market currencies rose from around $25 billion to $60 billion between April 1995 and October 1997. (Within this total, the dollar value of Asian currency trading generally declined between April 1997 and October 1997; the Thai baht was devalued on 1 July 1997 and other currencies came under pressure soon thereafter.)

Table D
Foreign exchange turnover in emerging markets

Currencies	Turnover (a) US$ billion per day			
	April 1995	April 1996	April 1997	October 1997
Asia:	13.6	19.0	22.1	20.5
Indonesian rupiah	4.8 (b)	7.8 (b)	8.7 (b)	8.5 (b)
Korean won	3.1	3.2	4.0	3.6
Thai baht	2.6	4.0	4.6	2.5
New Taiwan dollar	1.5	1.6	1.7	2.3
Indian rupee	1.6	1.2	1.7	2.0
Malaysian ringgit	n.a.	1.1	1.2	1.5
Philippine peso	0.02	0.1	0.2	0.1
Latin America:	10.1	12.9	17.5	23.7
New Mexican peso	3.2	4.2	7.1	9.5
Brazilian real	4.3	5.5	6.7	8.5
Argentine peso	1.7	2.0	2.2	3.0
Chilean peso	0.8	1.0	1.1	2.2
Colombian peso	n.a.	0.1	0.2	0.3
Peruvian sol	0.1	0.1	0.2	0.2
Eastern Europe:	1.8	7.5	8.8	15.3
Russian rouble	0.6	2.6	3.7	10.7
Czech koruna	0.6	2.5	3.2	2.1
Polish zloty	0.3 (b)	1.6 (b)	0.9 (b)	1.7 (b)
Hungarian forint	0.3	0.6	0.4	0.6
Slovak koruna	0.03	0.2	0.6	0.2
Total	**25.5**	**39.4**	**48.4**	**59.5**

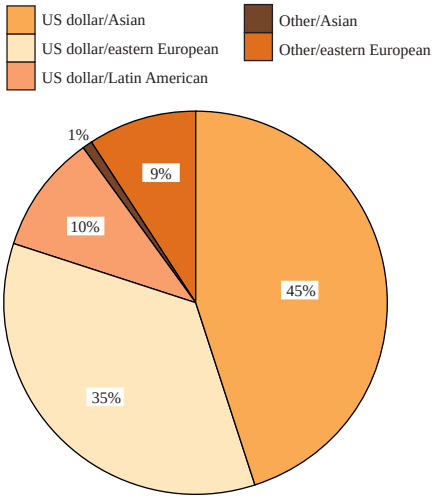
n.a. = not available.

Note: Reproduced from the BIS 68th Annual Report (June 1998), Table VI.5.

(a) Estimates as reported by national central banks, for their respective centres, net of local double-counting, unless otherwise specified. For Thailand, 1995 second-half and 1996 annual averages. For Indonesia and Argentina, 1995 and 1996 annual averages.
(b) Gross.

For the first time, the UK survey included a memorandum item on emerging market currencies. Estimated gross turnover in these currencies was $12.5 billion per day,(1) compared with aggregate gross turnover of $798 billion per day. Chart 3 illustrates that UK trading of the US dollar against Asian and eastern European currencies represented four fifths of emerging market turnover. Principals were also asked to identify currencies with turnover exceeding $100 million during April, equivalent to $5 million per day. Using this as a guide, the most actively traded currencies at that time were the Czech koruna (20 dealers reported monthly turnover in excess of $100 million), Malaysian ringgit (19), Thai baht (16), Indonesian rupiah (13), and Polish zloty (12). The ranking for Asian currencies in the New York survey is similar, but eastern European currencies appear to be more actively traded in London, and Latin American currencies in New York.

Chart 3
Turnover in currencies of the emerging market economies



Reporters were asked to include the following currencies:
Eastern European: Czech koruna, Hungarian forint, Polish zloty, Russian rouble, Slovak koruna, Slovenian tolar.
Latin American: Argentine peso, Brazilian real, Chilean peso, New Mexican peso, Peruvian sol.
Asian: Indian rupee, Indonesian rupiah, Korean won, Malaysian ringgit, New Taiwan dollar, Thai baht.

Counterparties

As Table E shows, the proportion of principals' turnover accounted for by domestic and international interbank business rose from 75% to 83%. The rise was attributable to the faster growth of cross-border business. Overall, cross-border transactions accounted for 66% of net turnover. The global results show that cross-border deals account for a relatively high proportion of UK turnover. The comparable figure reported by the BIS was 54% of global turnover.

The share of business with other financial institutions, such as pension funds, fell to 9½%. This reverses the trend between 1989 and 1995. The share of business with non-financial institutions was steady at 7%. The results of the derivatives survey were similar: other financial institutions and non-financial institutions accounted for 13% and 8% respectively of turnover in currency derivatives.

Table E
Average daily turnover by counterparty

US$ billions; *percentage of total net turnover in italics*

	1989		1992		1995		1998	
Gross turnover	241		357		571		798.2	
of which:								
Domestic interbank (a)	108		134		215		322.7	
Net domestic turnover (b)	187		290		464		637.3	
of which:								
Other financial institutions	16	*9*	42	*14*	85	*18*	60.5	*9.5*
Non-financial institutions	10	*5*	24	*8*	30	*7*	46.6	*7.3*
Cross-border interbank	107	*57*	158	*55*	241	*52*	369.3	*57.9*
Net domestic interbank	54	*29*	67	*23*	108	*23*	160.9	*25.2*

(a) Domestic interbank deals are those between two banks located in the United Kingdom.
(b) Net domestic turnover is after adjustment for double-counting of such deals.

Market concentration

The combined market share of the top ten principals, which was stable in the previous survey, rose from 44% to 50%. The top twenty's share—fifteen of which were in the top twenty in 1995—reached 69% (68% in 1995, and 63% in 1992). But the number of firms individually accounting for more than 1% of total turnover has remained stable at around 25 since 1992. So business remains well dispersed among the largest institutions. The results of the US survey were similar. For example, the top ten principals' market share in the United States rose from 48% to 51%. In contrast, other markets are more concentrated than those in either the United Kingdom or the United States: in France, for example, the top ten institutions accounted for four fifths of turnover.

Previous surveys found that business was more widely dispersed in the most actively traded currencies than in others. But Table F shows that the top ten principals' market share in a range of different currencies converged: the range is now between 52%–57%.

Table F
Percentage share of the ten principals most active in individual currency pairs

	1986	1989	1992	1995	1998
£/US$	40	34	48	50	57
US$/DM	38	37	43	40	54
US$/¥	46	39	48	47	52
US$/SwFr	57	60	66	66	55
US$/FFr	70	61	54	51	55

Foreign-owned institutions operating in the UK market account for 85% of principals' aggregate turnover in the United Kingdom in 1998, compared with 79% in 1995. North American principals remain the most active, with a 49% market share, and their share rose in all US dollar pairs (see Table G). In contrast, UK principals' share of sterling trading declined, partly reflecting mergers between UK principals and institutions from the rest of the European Union (reducing the number of UK principals). The proportion of turnover transacted by Japanese principals fell from 10% to 7%, and their share of the US dollar/yen market fell from around one third to less than one quarter. A similar trend was evident in Japan: foreign firms' share of customer transactions more than doubled, to 65% of customer business transacted by principals.

(1) It was not possible to eliminate local double-counting for these currencies. The figure may underestimate turnover in emerging market currencies, because not all reporters completed the memorandum item.

Table G
Principals' shares of the London market in different currencies by country grouping

Per cent	US dollar against: £		DM		¥		SwFr		Can$		Aus$	
Nationality of principal												
United Kingdom	28	*38*	15	*18*	11	*14*	8	*13*	5	*7*	15	*27*
Other European Union	20	*13*	21	*17*	11	*8*	11	*7*	6	*15*	8	*2*
North American	39	*33*	46	*44*	46	*40*	64	*54*	77	*69*	41	*34*
Japan	5	*6*	8	*10*	23	*30*	5	*2*	1	*1*	1	*1*
Other	8	*9*	10	*11*	9	*8*	12	*25*	11	*8*	36	*36*

	Sterling against: DM		DM against: ¥		SwFr		**Total**	
Nationality of principal								
United Kingdom	26	*31*	21	*23*	29	*16*	**15**	***21***
Other European Union	24	*14*	26	*6*	16	*4*	**18**	***15***
North American	38	*36*	26	*28*	33	*42*	**49**	***42***
Japan	5	*7*	20	*31*	3	*2*	**7**	***10***
Other	7	*12*	8	*11*	20	*37*	**11**	***12***

Note: Figures for 1995 are in italics.

Brokers

The proportion of principals' total foreign exchange business handled by brokers fell to 27%. In 1995, the proportion of principals' total foreign exchange business transacted by brokers was 35%, little changed from 34% in 1992. The electronic brokers' share of principals' total foreign exchange business rose from 5% to 11% (they were not active at the time of the 1992 survey), and the proportion of business conducted by traditional voice brokers declined from 30% to 16%.(1) The number of voice brokers in the foreign exchange market was little changed from 1995, although several withdrew from the spot market. Overall, the structure of brokers' business, in terms of the relative proportion of spot and forward business transacted by brokers, changed little between 1995–98 (see Table H). The proportion of short-dated swaps business increased, in line with the rise in short-dated swaps' share of total turnover. Table I shows that the proportion of brokered transactions involving a UK principal has declined slightly between 1995–98, from 90% to 86%.(2)

Table H
Types of transaction—all brokers' turnover

Percentage of total turnover

	1992	1995	1998
Spot	52	46	46
Forwards: outright	2	1	4
Forwards: swaps	46	53	50
of which:			
Up to and for 7 days	31	35	43
7 days and up to and for 1 month	4	5	4
1 month and up to 6 months	9	8	4
6 months up to and for 1 year	3	5	3
Over 1 year	1	1	0

Electronic brokers now handle 70% of principals' spot deals transacted via brokers. And almost one quarter of spot transactions in the UK market are conducted by the electronic brokers (the proportion is almost one third in the United States). The scope of electronic brokers' business has become more diverse: a wider range of currency pairs and products (eg forwards) is available. However, spot trading of the US dollar against the Deutsche Mark and yen still accounts for most of the two electronic brokers' volumes. In contrast, more than 95% of volumes transacted via electronic brokers in certain currency pairs (such as sterling/US dollar and US dollar/Swiss franc) are handled by a single system.

Table I
Counterparties to all brokers' turnover

Percentage of total turnover

	1989	1992	1995	1998
Between two principals in the United Kingdom	36	33	38	34
Between a principal in the United Kingdom and a principal abroad	50	49	52	52
Between two principals abroad	13	10	7	12
Other customers	1	8	3	2

OTC derivatives

Daily turnover in the United Kingdom

Average daily turnover in the United Kingdom for OTC currency and interest rate derivatives was $171 billion, 131% higher than the $74 billion recorded by the previous survey. Overall, currency derivatives grew by 218% over the three-year period, compared with 110% for interest rate derivatives. The interest rate derivatives market is still larger, however, now accounting for $123 billion per day (up from $59 billion)—some 2½ times the size of the currency derivatives market, at $48 billion per day (up from $15 billion).

Just over half the firms taking part in the survey thought that the overall level of turnover during the survey period was normal; 22% considered it to be above normal; and 5% below normal. The remaining 21% did not comment. Some participants reported that they undertook some unusually large interest rate trades in ERM currencies in April, ahead of the decisions at the start of May on the initial members of EMU and the bilateral rates at which they would join. This will have inflated both these firms'

(1) Voice brokers quote prices over lines to principals' dealing rooms. The EBS Partnership and Reuters Transaction Services Ltd provide automated electronic order-matching systems.
(2) The analysis of brokers' business excludes deals between principals abroad transacted by electronic brokers.

turnover values and share of the interest rate markets, and overall UK turnover in ERM interest rate products.

Global turnover

The results from the eight largest centres in 1995 show that the United Kingdom has consolidated its position as the world's largest centre for OTC derivatives business (see Chart 4).

Chart 4
OTC derivatives turnover—UK and other centres

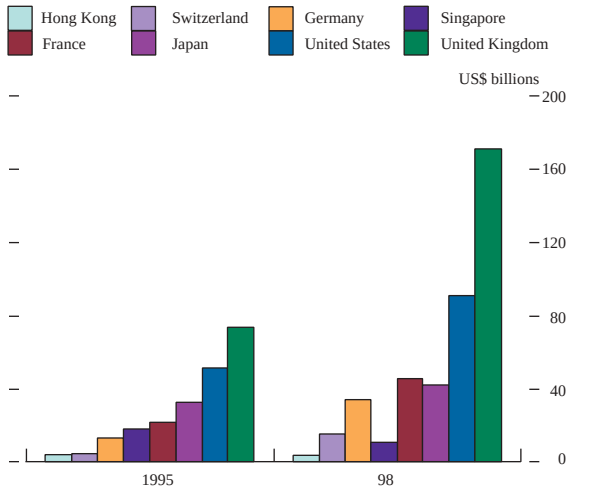


Table J shows that growth between the two surveys was slower outside Europe than within it: the United States and Japan both recorded slower growth than the major European centres, and turnover in both Singapore and Hong Kong fell. Of the eight largest centres, the Swiss market grew most rapidly, although it remains small relative to the UK market. The BIS's estimate of global turnover (which eliminates double-counting between countries) was $362 billion per day in April 1998, an increase of 85% from $196 billion in April 1995. The United Kingdom's share of the global OTC currency and interest rate derivatives market rose to 36% in April 1998, compared with 27% in 1995.

Table J
Average daily OTC derivatives turnover in major financial centres

US$ billions

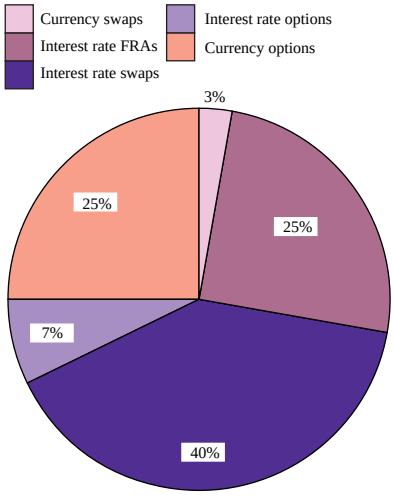
	1995	1998	Percentage change
United Kingdom	74	171	131
United States	52	91	75
France	22	46	107
Japan	33	42	28
Germany	13	34	162
Switzerland	4	16	257
Singapore	18	11	-38
Hong Kong	4	4	-10

By way of comparison, BIS figures(1) show that the value of global turnover in interest rate and currency products on organised derivatives exchanges grew by less than 1% between 1994 and 1997. Average daily turnover of these—typically shorter-maturity—products in 1998 Q1 was $1,399 billion.

Type of transaction

There has been a significant shift in the balance of business between interest rate swaps and FRAs: in 1998, interest rate swaps dominated the market (see Chart 5), with 40% of turnover (up from 25% in 1995), in contrast with 1995, when FRA business accounted for the largest share, with 47% (this share has now dropped to 25%). The dominance of interest rate swaps in 1998 is not unique to the United Kingdom—there has been a similar change in a number of the other major financial centres (eg Germany, France, Japan and Hong Kong).

Chart 5
OTC derivatives turnover—product breakdown



Average daily turnover: $171 billion

The overall market shares reflect changes within the interest rate derivatives sector, which accounted for 72% of total turnover in April 1998, compared with 80% in 1995: swaps increased their share of interest rate trading from 32% to 56%, with growth of 271% over the three-year period. Conversely, FRAs' market share dropped from 59% to 35%, though turnover in FRAs grew by 22% between the surveys. The share of interest rate options rose from 9% to 10%.

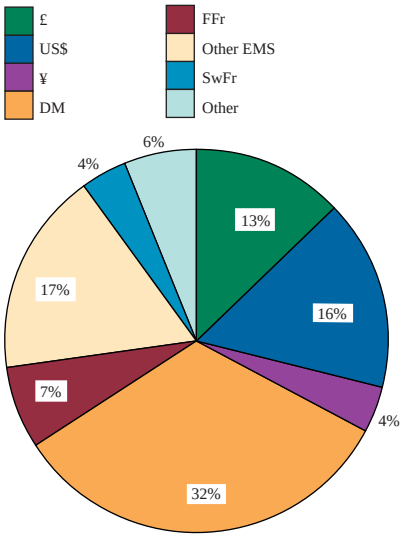
In the currency derivatives sector, there has been little change in the breakdown between instruments: currency options accounted for 89% (down from 91% in 1995) and currency swaps 11% (up from 9% in 1995). Though turnover in currency swaps has grown by 263%, the growth of 213% in currency options—typically with shorter maturities—has contributed most to the absolute increase in turnover in the currency derivatives market.

Currency composition

ERM currencies dominated trading in the UK interest rate derivatives market, accounting for 56% of all business(2) (see Chart 6). Within ERM currencies, the Deutsche Mark alone accounted for 32%, almost doubling its share of the interest rate derivatives market since the previous survey. Deutsche Mark business also grew in other centres: in Germany, the

(1) Data obtained from *International Banking and Financial Market Developments*, Bank for International Settlements, Table 20A.
(2) This figure includes Ecu and Swedish krona business.

Chart 6
OTC interest rate derivatives turnover—currency breakdown



Average daily turnover: $123 billion

Note: Percentage shares have been rounded to the nearest whole number.

market share of Deutsche Mark interest rate business grew by 10 percentage points, to almost three quarters; in France, Deutsche Mark business grew from 4% to 19% of the market. In the United Kingdom, only the FRA market was not dominated by ERM currencies—in FRAs, the US dollar and sterling accounted for 39% between them, compared with only 24% for interest rate swaps and 27% for interest rate options.

The only currency where the value of interest rate derivatives trading in the United Kingdom fell between 1995 and 1998 was the yen, where total turnover (in US dollar terms) fell by 4%. But this owes much to the decline in the US dollar/yen exchange rate between the two survey periods—in yen terms, turnover rose by 53%.

The picture was different in the currency derivatives market (see Table K), where the US dollar maintained its dominant position and the Deutsche Mark lost market share. In the 1995 survey, the most active currency pairing was the US dollar/Deutsche Mark. This was overtaken between the two surveys by the US dollar/yen pair, which grew particularly strongly in currency options, perhaps reflecting the market's expectation in April that this bilateral rate would become increasingly volatile.

Table K
OTC currency derivatives turnover—currency breakdown

Percentage of the market where the currency constitutes one leg of the trade

	1995	1998
US$	77	76
DM	51	42
£	12	17

Note: As there are two currency legs to each trade, percentages will add up to more than 100.

As in the foreign exchange market, derivatives trades between the Deutsche Mark and another ERM currency lost market share (falling from 9% to 3%). But in the derivatives market, this was not offset by an increase in US dollar/ERM trading. The US dollar/Deutsche Mark pair fell from 31% to 22% of the currency derivatives market, while US dollar/other ERM maintained a steady 10% of the market. This supports the foreign exchange findings that cross-trading between ERM currencies has declined—doubtless in anticipation of EMU—but suggests that the US dollar/ERM options market (as currency options dominate this sector) has not developed as rapidly as the corresponding spot, forward and swap markets.

Counterparties

Table L shows that the most active counterparties in the interest rate and currency derivatives markets were banks and securities firms, which accounted for 73% (down from 84% in 1995) of the total transactions in April 1998. Correspondingly, the share of business of other financial institutions increased to 21% (up from 10% in 1995). The share of business of non-financial institutions remained relatively steady at 6% (down from 7% in 1995).

Table L
Average daily turnover by counterparty—currency and interest rate derivatives

US$ billions; *percentage of net turnover in italics*

	Interest rate derivatives				Currency derivatives			
	1995		1998		1995		1998	
Gross turnover	77		152		17		60	
of which:								
Domestic interbank (a)	36		59		4		25	
Net domestic turnover (b)	59		123		15		48	
of which:								
Other financial institutions	5	*9*	30	*24*	2	*12*	6	*13*
Non-financial institutions	3	*6*	6	*5*	1	*10*	4	*8*
Cross-border interbank	32	*55*	58	*47*	10	*66*	26	*53*
Net domestic interbank	18	*31*	29	*24*	2	*12*	12	*26*

(a) Domestic interbank deals are those between two banks located in the United Kingdom.
(b) Net domestic turnover is after adjustment for double-counting of such deals.

The results in the overall market reflect the changes within the interest rate derivatives market. Banks and securities firms transacted most business, although their share fell from 86% to 71% over the three-year period. The share of interest rate business undertaken by other financial institutions grew to 24% (from 9% in 1995). It seems likely that this figure is distorted by a number of unusually large interest rate trades with other financial institutions in the ERM currencies in April, ahead of the May EMU announcements. Non-financial institutions' business was little changed at 5% (down from 6% in 1995).

In the currency derivatives market, there has been little change in the overall breakdown between counterparties. Interbank activity continues to dominate, with 79% (up from 78% in 1995) of the market. The levels of interbank activity undertaken locally and cross-border have, however, changed substantially: interbank cross-border trading still makes up the largest proportion of activity, but fell from 66% of the market in 1995 to 53% in 1998. The decline is

mainly accounted for by the drop from 62% to 48% in the interbank cross-border activity in currency options (which comprise 89% of the currency derivatives market).

Market concentration

Overall, concentration in the UK market has increased since 1995. The top ten principals' combined market share rose from 52% to 67%, and the top twenty's rose from 74% to 82%.

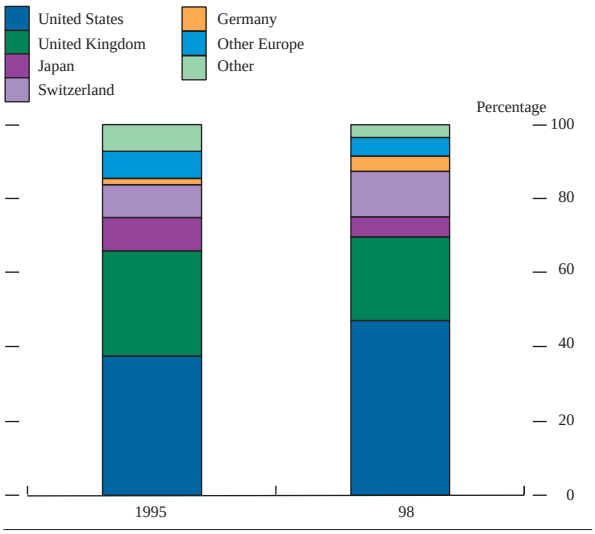
The currency derivatives market appears to be more concentrated than the interest rate market, with a smaller number of participants undertaking currency derivatives business than interest rate derivatives business during April 1998. Although the top five companies in the currency derivatives market hold 51% of the market, compared with 54% in the interest rate market, 20 companies hold 91% of the currency derivatives market, compared with 82% in the interest rate market.

Activity in currency derivatives during April 1998 was reported by 130 firms. 14 firms had 1% or more of the currency market; 7 had between 1%–5%; and 6 had between 5%–10%. Activity in interest rate derivatives during April 1998 was reported by 178 firms. 24 firms had 1% or more of the interest rate market; 19 had between 1%–5%; and 3 had between 5%–10%.

Market share of foreign banks

Chart 7 shows that, as in the foreign exchange survey, foreign-owned institutions dominated the UK OTC derivatives market, with UK firms accounting for only 23% of turnover(1) (down from 28% in 1995). US principals continued to dominate, increasing their market share from 37% to 47%. Continental European firms also gained market share, led mainly by German and Swiss firms. Japanese banks, however, lost market share, falling from 9% to 5%—reflecting both the turbulence experienced by these firms around the time of the survey, and the fact that

Chart 7
Derivatives market by nationality of bank



some Japanese firms consolidated in their home country and pulled out of the UK market in the three years between the two surveys.

There were some interesting developments within the different product types. US firms lost market share in currency derivatives, but compensated for this by increasing their share of the interest rate derivatives market from 37% to 53%. The main beneficiaries of US firms' relative decline in the currency derivatives market were Swiss firms (of which nine are active in the United Kingdom market), which increased their market share from 15% to 32% and now account for as much currency derivatives turnover in the United Kingdom as US firms do. UK principals lost market share (from 30% to 22%) in interest rate derivatives, and were the only major national group (compared with US, German, Japanese and Swiss firms) to have higher turnover in FRAs than in interest rate swaps—possibly suggesting that they have been concentrating their business at the shorter end of the market, which has suffered a relative decline in the period between the two surveys.

(1) All turnover figures in this section are gross.

Table M
Principals' average daily gross foreign exchange turnover

US$ millions (rounded to the nearest million)

		US dollar against:											Sterling against:			
		DM	¥	Aus$	SwFr	Can$	FFr	Pta	Lit	Other EMS currencies	Ecu	Other	US$	DM	¥	Aus$
Spot																
Interbank counterparties	Local	32,468	16,407	2,123	5,436	2,343	2,984	939	3,118	1,274	492	3,353	23,314	11,646	315	16
Interbank counterparties	Cross-border	38,917	18,545	1,659	4,779	2,024	1,611	270	2,188	2,073	248	5,345	10,619	8,312	406	7
Other financial institutions	Local	3,408	2,447	283	825	121	568	168	331	672	95	656	1,484	936	129	7
Other financial institutions	Cross-border	2,971	2,059	79	538	72	115	25	150	611	49	512	534	410	88	1
Non-financial institutions	Local	778	758	44	234	59	115	59	64	202	41	99	1,289	483	68	20
Non-financial institutions	Cross-border	2,422	1,324	67	453	91	155	73	79	276	20	217	843	725	36	1
Sub-total		**80,964**	**41,540**	**4,254**	**12,266**	**4,710**	**5,550**	**1,535**	**5,931**	**5,107**	**944**	**10,182**	**38,084**	**22,511**	**1,042**	**52**
Outright forward																
Interbank counterparties	Local	3,525	2,679	203	773	315	796	407	1,030	1,451	462	1,555	4,519	756	87	6
Interbank counterparties	Cross-border	4,398	2,358	384	1,356	1,046	707	329	1,239	1,004	149	2,402	2,047	652	49	2
Other financial institutions	Local	1,117	469	697	160	60	134	222	690	339	29	524	890	263	57	25
Other financial institutions	Cross-border	937	794	99	282	30	105	16	134	218	47	394	290	134	15	3
Non-financial institutions	Local	483	311	61	96	82	134	33	78	111	10	161	874	179	42	25
Non-financial institutions	Cross-border	639	338	18	137	54	117	86	69	151	22	253	429	209	16	5
Sub-total		**11,100**	**6,950**	**1,462**	**2,803**	**1,586**	**1,992**	**1,092**	**3,240**	**3,275**	**720**	**5,289**	**9,049**	**2,193**	**266**	**65**
Foreign exchange swaps																
Interbank counterparties	Local	28,211	19,927	4,433	10,490	5,702	8,499	3,766	14,088	23,462	4,975	13,935	33,014	464	151	4
Interbank counterparties	Cross-border	41,740	24,752	5,103	15,298	7,083	16,277	8,615	17,888	28,068	6,226	19,841	29,040	935	101	7
Other financial institutions	Local	2,749	1,651	170	1,351	293	920	554	1,502	1,772	524	877	4,000	164	105	36
Other financial institutions	Cross-border	2,039	1,694	113	608	304	464	215	696	775	258	375	1,238	58	7	8
Non-financial institutions	Local	1,166	1,040	387	680	145	363	72	216	1,963	756	675	2,714	206	54	56
Non-financial institutions	Cross-border	2,484	2,103	201	1,311	221	811	262	631	1,518	1,607	945	1,977	249	15	2
Sub-total		**78,387**	**51,167**	**10,408**	**29,737**	**13,749**	**27,335**	**13,483**	**35,020**	**57,558**	**14,346**	**36,649**	**71,983**	**2,075**	**433**	**113**
	Total	**170,451**	**99,658**	**16,124**	**44,806**	**20,045**	**34,876**	**16,110**	**44,191**	**65,940**	**16,011**	**52,119**	**119,117**	**26,779**	**1,742**	**230**
Maturity of forwards	Up to and for 7 days	70,042	42,370	9,640	26,119	13,408	23,182	10,254	28,794	49,781	12,965	33,517	63,888	2,666	389	64
	Over 7 days up to and for 1 month	7,552	4,361	641	2,387	547	2,638	1,609	3,038	4,802	912	2,669	7,117	436	105	38
	Over 1 month up to and for 3 months	5,417	4,720	753	2,390	784	1,871	1,830	2,674	3,113	650	2,639	5,517	563	138	52
	Over 3 months up to and for 1 year	5,674	5,483	606	1,356	560	1,425	752	3,604	2,721	498	2,817	4,082	395	52	19
	Over 1 year	802	1,183	230	288	36	211	130	151	417	42	296	429	209	16	5

								Deutsche Mark against:										
SwFr	Can$	FFr	Pta	Lit	Other EMS currencies	Ecu	Other	¥	SwFr	FFr	Lit	Pta	Other EMS currencies	Ecu	Other	Ecu/ other currencies	Residual	**Total all currencies**
239	18	166	65	164	67	14	93	4,853	2,280	1,074	1,388	353	1,970	486	1,870	56	292	**121,678**
133	7	115	14	81	109	16	18	4,698	4,377	1,995	2,119	581	3,522	900	2,643	202	625	**119,159**
34	4	21	10	27	47	1	35	318	267	132	382	62	172	29	162	3	61	**13,894**
8	3	20	2	8	13	5	3	208	170	64	95	18	156	33	153	13	133	**9,321**
35	17	70	40	30	116	10	59	98	72	46	39	19	74	4	62	5	77	**5,185**
24	3	21	14	23	67	1	8	263	343	116	128	46	313	29	173	8	142	**8,502**
473	**52**	**412**	**144**	**332**	**420**	**47**	**216**	**10,438**	**7,509**	**3,428**	**4,151**	**1,078**	**6,208**	**1,480**	**5,065**	**287**	**1,330**	**277,740**
32	4	83	26	55	113	10	26	363	101	100	146	39	385	37	111	34	69	**20,297**
15	1	115	9	24	51	2	10	509	214	242	210	45	453	88	145	45	737	**21,037**
18	10	22	6	19	66	4	25	67	69	38	35	23	59	5	60	4	58	**6,266**
14	3	16	1	5	32	3	2	66	55	16	38	6	109	2	43	9	158	**4,076**
16	9	75	28	24	107	8	50	43	26	8	12	5	29	2	46	3	61	**3,232**
15	4	21	4	17	48	4	3	73	41	13	31	5	102	13	131	21	117	**3,207**
109	**31**	**330**	**74**	**144**	**419**	**30**	**116**	**1,122**	**506**	**418**	**474**	**122**	**1,137**	**146**	**537**	**116**	**1,200**	**58,115**
24	2	67	11	43	45	3	10	176	62	27	107	27	142	28	6,999	145	710	**179,748**
36	4	84	11	104	71	5	11	481	216	345	516	79	391	40	3,398	264	2,094	**229,123**
8	8	17	10	8	62	1	19	28	19	11	23	21	30	2	200	11	74	**17,223**
19	5	7	4	41	40	10	10	96	40	8	40	1	66	9	314	19	153	**9,735**
52	8	103	24	36	194	3	38	56	24	40	8	10	26	2	80	6	88	**11,292**
13	14	61	3	25	49	1	13	36	83	48	64	7	62	21	115	14	229	**15,193**
152	**42**	**339**	**62**	**257**	**462**	**23**	**101**	**874**	**444**	**479**	**758**	**145**	**718**	**102**	**11,107**	**459**	**3,348**	**462,316**
734	**124**	**1,082**	**280**	**733**	**1,300**	**100**	**433**	**12,434**	**8,459**	**4,324**	**5,383**	**1,345**	**8,062**	**1,728**	**16,709**	**861**	**5,878**	**798,171**
93	30	318	57	142	433	15	105	1,071	570	639	559	106	1,011	150	9,807	315	2,801	**405,302**
78	18	192	29	97	147	16	46	396	149	162	106	58	244	49	992	125	918	**42,672**
59	16	77	23	102	143	10	52	271	99	54	137	60	191	27	378	93	495	**35,397**
16	5	62	22	43	109	9	10	184	91	29	398	38	307	10	337	33	301	**32,047**
15	4	21	4	17	48	4	3	73	41	13	31	5	102	13	131	9	34	**5,012**

Table N
Principals' average daily OTC currency derivatives gross turnover

US$ millions (rounded to the nearest million)

	Sterling against:													US dollar against:					
	US$	DM	¥	FFr	SwFr	Can$	Aus$	Lit	Pta	Ecu	Other EMS currencies	Other	**Total**	DM	¥	FFr	SwFr	Can$	Aus$
Currency swaps																			
Interbank counterparties	450	60	10	1	8	4	4	6	1	1	11	22	**579**	483	1,214	253	186	10	30
Local	*337*	*26*	*9*	*1*	*8*	*0*	*1*	*3*	*0*	*1*	*6*	*7*	***398***	*301*	*644*	*146*	*118*	*5*	*13*
Cross-border	*113*	*34*	*2*	*0*	*0*	*4*	*4*	*3*	*1*	*1*	*4*	*15*	***181***	*182*	*571*	*108*	*68*	*5*	*17*
Other financial institutions	25	1	0	2	0	0	0	1	136	1	2	6	**173**	81	140	56	2	4	10
Local	*19*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*136*	*1*	*2*	*0*	***159***	*8*	*82*	*1*	*0*	*0*	*0*
Cross-border	*6*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*	***14***	*73*	*58*	*55*	*2*	*4*	*10*
Non-financial institutions	94	3	6	3	14	0	0	3	0	2	6	0	**133**	63	72	13	34	7	4
Local	*50*	*1*	*5*	*3*	*14*	*0*	*0*	*3*	*0*	*2*	*2*	*0*	***81***	*3*	*19*	*0*	*1*	*0*	*0*
Cross-border	*45*	*2*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*4*	*0*	***52***	*59*	*53*	*13*	*33*	*7*	*4*
Sub-total	**569**	**64**	**16**	**7**	**22**	**4**	**5**	**10**	**137**	**4**	**19**	**28**	**885**	**627**	**1,426**	**323**	**222**	**21**	**43**
OTC options sold																			
Interbank counterparties	1,630	2,455	116	7	151	0	4	26	4	11	25	0	**4,428**	5,260	5,982	211	731	235	367
Local	*920*	*1,250*	*81*	*5*	*109*	*0*	*3*	*9*	*3*	*6*	*3*	*0*	***2,390***	*2,046*	*2,554*	*119*	*372*	*33*	*147*
Cross-border	*710*	*1,205*	*35*	*2*	*42*	*0*	*1*	*17*	*0*	*4*	*21*	*0*	***2,038***	*3,215*	*3,428*	*92*	*360*	*202*	*220*
Other financial institutions	54	83	3	0	19	–	0	7	3	0	1	–	**172**	510	941	53	114	32	24
Local	*2*	*8*	*2*	*0*	*0*	*0*	*0*	*1*	*3*	*0*	*0*	*0*	***16***	*59*	*132*	*1*	*8*	*4*	*4*
Cross-border	*51*	*75*	*1*	*0*	*19*	*–*	*0*	*7*	*0*	*0*	*1*	*–*	***155***	*451*	*808*	*52*	*107*	*28*	*20*
Non-financial institutions	141	121	10	7	4	0	3	1	5	6	6	4	**310**	267	413	104	81	17	45
Local	*45*	*12*	*4*	*3*	*1*	*0*	*1*	*1*	*0*	*0*	*4*	*2*	***73***	*40*	*187*	*0*	*–*	*2*	*6*
Cross-border	*96*	*110*	*6*	*5*	*3*	*0*	*2*	*0*	*5*	*6*	*2*	*2*	***236***	*228*	*226*	*104*	*–*	*15*	*39*
Sub-total	**1,825**	**2,659**	**128**	**15**	**174**	**–**	**8**	**35**	**12**	**17**	**32**	**–**	**4,910**	**6,038**	**7,335**	**368**	**927**	**285**	**437**
OTC options bought																			
Interbank counterparties	1,510	2,395	108	11	129	5	11	17	1	6	21	3	**4,218**	5,097	5,914	243	718	243	402
Local	*798*	*1,286*	*73*	*7*	*94*	*0*	*5*	*2*	*0*	*0*	*5*	*3*	***2,273***	*1,931*	*2,388*	*96*	*288*	*20*	*152*
Cross-border	*713*	*1,109*	*35*	*4*	*36*	*5*	*6*	*15*	*1*	*6*	*16*	*0*	***1,945***	*3,166*	*3,525*	*147*	*430*	*218*	*249*
Other financial institutions	58	115	15	0	1	0	0	7	2	0	6	0	**204**	547	1,251	35	98	16	21
Local	*5*	*14*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***26***	*79*	*131*	*0*	*6*	*0*	*3*
Cross-border	*53*	*101*	*9*	*0*	*1*	*0*	*0*	*7*	*2*	*0*	*6*	*0*	***178***	*468*	*1,120*	*35*	*93*	*16*	*17*
Non-financial institutions	150	101	13	3	5	0	3	1	8	0	6	1	**289**	345	399	113	80	9	31
Local	*75*	*17*	*9*	*1*	*1*	*0*	*2*	*0*	*1*	*0*	*2*	*0*	***108***	*44*	*204*	*1*	*–*	*1*	*9*
Cross-border	*75*	*84*	*5*	*2*	*4*	*0*	*1*	*0*	*7*	*0*	*3*	*1*	***181***	*301*	*195*	*112*	*–*	*8*	*22*
Sub-total	**1,718**	**2,611**	**136**	**14**	**135**	**5**	**14**	**24**	**11**	**6**	**33**	**5**	**4,710**	**5,989**	**7,564**	**391**	**897**	**263**	**454**
Total OTC options	**3,542**	**5,270**	**264**	**29**	**309**	**–**	**22**	**59**	**23**	**23**	**64**	**–**	**9,620**	**12,027**	**14,899**	**759**	**1,824**	**547**	**891**
Total FX contracts	**4,111**	**5,334**	**281**	**36**	**331**	**–**	**26**	**69**	**160**	**27**	**83**	**–**	**10,505**	**12,654**	**16,325**	**1,082**	**2,046**	**568**	**934**

Note: – indicates that there were fewer than three reporters and the figures have been suppressed at the request of the reporters.

						Deutsche Mark against:													
Lit	Pta	Ecu	Other EMS currencies	Other	**Total**	¥	FFr	SwFr	Can$	Aus$	Lit	Pta	Ecu	Other EMS currencies	Other	**Total**	Ecu/ other currencies	Residual	**Total all currencies**
511	131	171	545	518	**4,055**	56	8	17	0	1	42	23	12	15	12	**185**	46	69	**4,934**
228	*73*	*40*	*230*	*118*	***1,916***	*16*	*1*	*1*	*0*	*0*	*3*	*4*	*0*	*6*	*2*	***32***	*28*	*1*	***2,375***
283	*58*	*132*	*315*	*400*	***2,139***	*40*	*8*	*16*	*0*	*0*	*39*	*19*	*12*	*9*	*10*	***153***	*18*	*68*	***2,559***
37	10	39	101	59	**540**	4	6	0	0	0	2	7	0	1	2	**21**	8	18	**760**
21	*8*	*26*	*13*	*26*	***186***	*2*	*0*	*0*	*0*	*0*	*0*	*7*	*0*	*1*	*1*	***11***	*0*	*1*	*358*
16	*1*	*13*	*88*	*34*	***354***	*2*	*6*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	***10***	*8*	*16*	*402*
14	3	0	51	29	**289**	10	0	2	8	0	2	0	0	4	18	**44**	84	96	**646**
1	*0*	*0*	*14*	*1*	***38***	*8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	***8***	*0*	*0*	***128***
13	*3*	*0*	*37*	*29*	***251***	*2*	*0*	*2*	*8*	*0*	*2*	*0*	*0*	*3*	*18*	***36***	*84*	*95*	***518***
562	**144**	**211**	**698**	**607**	**4,884**	**70**	**14**	**19**	**8**	**1**	**46**	**29**	**12**	**20**	**32**	**250**	**138**	**183**	**6,339**
2,557	4	8	91	211	**15,658**	718	44	857	0	18	516	40	27	98	111	**2,430**	9	564	**23,089**
2,528	*1*	*0*	*10*	*75*	***7,884***	*300*	*7*	*379*	*0*	*8*	*273*	*16*	*27*	*28*	*35*	***1,075***	*3*	*137*	***11,489***
30	*3*	*8*	*81*	*136*	***7,774***	*417*	*37*	*478*	*0*	*10*	*243*	*24*	*0*	*70*	*75*	***1,356***	*6*	*428*	***11,601***
9	1	0	23	24	**1,732**	288	3	101	0	8	88	9	0	9	76	**581**	0	18	**2,502**
0	*0*	*0*	–	–	***211***	*4*	*0*	*18*	*0*	*0*	*24*	*0*	*0*	*0*	*0*	***46***	*0*	*1*	***275***
9	*1*	*0*	–	–	***1,520***	*284*	*3*	*83*	*0*	*8*	*64*	*9*	*0*	*9*	*76*	***535***	*0*	*17*	***2,227***
12	0	0	13	36	**989**	81	0	103	0	0	5	0	0	7	19	**215**	3	19	**1,535**
0	–	*0*	*0*	*2*	***253***	*28*	*0*	*45*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	***76***	*3*	*3*	***408***
12	–	*0*	*13*	*33*	***736***	*58*	*0*	*58*	*0*	*0*	*2*	*0*	*0*	*7*	*19*	***139***	*0*	*16*	***1,127***
2,578	**5**	**8**	**127**	**271**	**18,378**	**1,087**	**48**	**1,061**	**0**	**26**	**609**	**49**	**27**	**115**	**205**	**3,226**	**11**	**600**	**27,126**
2,553	3	5	69	224	**15,465**	712	38	923	2	21	529	44	0	135	120	**2,523**	6	285	**22,496**
2,526	*2*	*5*	*7*	*79*	***7,494***	*291*	*17*	*471*	*2*	*11*	*263*	*25*	*0*	*54*	*45*	***1,180***	*0*	*123*	***11,071***
27	*1*	*0*	*62*	*145*	***7,970***	*421*	*21*	*452*	*0*	*10*	*266*	*18*	*0*	*81*	*75*	***1,344***	*6*	*161*	***11,426***
12	8	0	37	18	**2,044**	280	4	92	4	6	65	0	0	5	59	**515**	0	26	**2,790**
0	–	*0*	–	*1*	***258***	*2*	*0*	*18*	*0*	*0*	*26*	*0*	*0*	*0*	*0*	***46***	*0*	*10*	***341***
12	–	*0*	–	*18*	***1,786***	*278*	*4*	*74*	*4*	*6*	*39*	*0*	*0*	*5*	*59*	***469***	*0*	*16*	***2,449***
7	0	0	14	14	**1,013**	87	3	111	0	0	6	0	3	9	11	**229**	17	16	**1,564**
–	*0*	*0*	*0*	*1*	***275***	*37*	*0*	*45*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***82***	*17*	*1*	***484***
–	*0*	*0*	*14*	*14*	***738***	*50*	*3*	*66*	*0*	*0*	*6*	*0*	*3*	*9*	*11*	***147***	*0*	*15*	***1,080***
2,572	**11**	**5**	**121**	**257**	**18,522**	**1,079**	**45**	**1,127**	**6**	**27**	**600**	**44**	**3**	**149**	**190**	**3,268**	**23**	**327**	**26,851**
5,150	**16**	**13**	**249**	**527**	**36,900**	**2,166**	**93**	**2,188**	**6**	**53**	**1,209**	**92**	**30**	**264**	**395**	**6,495**	**34**	**927**	**53,977**
5,712	**159**	**223**	**946**	**1,134**	**41,784**	**2,235**	**107**	**2,206**	**14**	**53**	**1,254**	**121**	**42**	**284**	**427**	**6,745**	**172**	**1,110**	**60,316**

Table O
Principals' average daily OTC interest rate derivatives gross turnover

US$ millions (rounded to the nearest million)

	£	US$	DM	¥	FFr	SwFr	Can$	Aus$	Ecu	Other EMS currencies	Other	**Total**
FRAs												
Interbank counterparties	9,146	9,592	4,918	2,220	989	2,349	1,840	38	173	10,530	2,965	**44,760**
Local	*7,549*	*4,651*	*2,671*	*1,622*	*315*	*824*	*1,471*	*0*	*95*	*5,721*	*1,532*	***26,450***
Cross-border	*1,597*	*4,941*	*2,247*	*598*	*674*	*1,525*	*370*	*38*	*79*	*4,809*	*1,432*	***18,309***
Other financial institutions	1,740	1,325	3,118	449	72	35	17	294	3	1,299	441	**8,793**
Local	*1,615*	*1,176*	*2,936*	*105*	*8*	*0*	*4*	*287*	*0*	*955*	*341*	***7,428***
Cross-border	*124*	*149*	*182*	*344*	*64*	*35*	*13*	*8*	*3*	*344*	*100*	***1,365***
Non-financial institutions	436	374	177	156	62	133	34	25	1	491	222	**2,112**
Local	*348*	*198*	*78*	*22*	*22*	*48*	*27*	*15*	*1*	*393*	*26*	***1,179***
Cross-border	*88*	*176*	*99*	*134*	*39*	*85*	*7*	*10*	*0*	*98*	*196*	***933***
Sub-total	**11,322**	**11,291**	**8,213**	**2,825**	**1,123**	**2,517**	**1,891**	**357**	**177**	**12,320**	**3,628**	**55,665**
Swaps												
Interbank counterparties	8,056	8,824	19,965	2,819	6,846	2,495	896	330	606	8,890	1,492	**61,220**
Local	*5,199*	*2,984*	*9,184*	*973*	*2,963*	*1,289*	*294*	*78*	*273*	*3,550*	*721*	***27,507***
Cross-border	*2,857*	*5,840*	*10,781*	*1,846*	*3,883*	*1,206*	*602*	*252*	*333*	*5,341*	*771*	***33,713***
Other financial institutions	1,179	1,041	11,792	414	1,505	433	116	58	258	1,418	467	**18,679**
Local	*671*	*497*	*4,896*	*111*	*1,252*	*285*	*87*	*2*	*44*	*611*	*199*	***8,655***
Cross-border	*508*	*544*	*6,895*	*302*	*253*	*148*	*28*	*56*	*213*	*807*	*268*	***10,024***
Non-financial institutions	682	396	463	347	244	103	8	36	31	277	22	**2,609**
Local	*320*	*177*	*129*	*31*	*19*	*4*	*1*	*0*	*0*	*83*	*6*	***770***
Cross-border	*362*	*219*	*334*	*316*	*225*	*99*	*7*	*36*	*31*	*194*	*16*	***1,839***
Sub-total	**9,917**	**10,261**	**32,220**	**3,580**	**8,595**	**3,031**	**1,020**	**424**	**895**	**10,586**	**1,980**	**82,508**
OTC options sold												
Interbank counterparties	793	882	2,109	98	215	173	9	0	11	787	106	**5,184**
Local	*557*	*362*	*908*	*27*	*111*	*75*	*0*	*0*	*0*	*283*	*43*	***2,366***
Cross-border	*236*	*520*	*1,202*	*71*	*104*	*98*	*9*	*0*	*11*	*504*	*63*	***2,818***
Other financial institutions	161	71	571	27	46	8	7	0	0	270	2	**1,164**
Local	*157*	*13*	*197*	*6*	*18*	*5*	*0*	*0*	*0*	*34*	*1*	***431***
Cross-border	*4*	*58*	*374*	*21*	*28*	*3*	*7*	*0*	*0*	*236*	*2*	***732***
Non-financial institutions	42	88	75	1	31	7	4	0	–	135	–	**384**
Local	*36*	*17*	*–*	*0*	*0*	*0*	*0*	*0*	*0*	*–*	*–*	***73***
Cross-border	*6*	*71*	*–*	*1*	*31*	*7*	*4*	*0*	*–*	*–*	*0*	***312***
Sub-total	**997**	**1,041**	**2,755**	**126**	**292**	**188**	**19**	**0**	**–**	**1,192**	**–**	**6,732**
OTC options bought												
Interbank counterparties	840	958	2,233	110	199	181	17	0	–	680	–	**5,326**
Local	*666*	*426*	*890*	*31*	*70*	*92*	*4*	*0*	*0*	*282*	*39*	***2,498***
Cross-border	*174*	*532*	*1,344*	*80*	*130*	*89*	*14*	*0*	*–*	*398*	*–*	***2,828***
Other financial institutions	67	63	686	61	33	17	3	0	0	150	30	**1,111**
Local	*23*	*19*	*473*	*11*	*26*	*12*	*3*	*0*	*0*	*21*	*4*	***594***
Cross-border	*44*	*44*	*213*	*50*	*7*	*5*	*0*	*0*	*0*	*130*	*25*	***517***
Non-financial institutions	150	108	166	7	34	22	2	0	–	503	–	**997**
Local	*–*	*72*	*–*	*0*	*3*	*0*	*0*	*0*	*0*	*–*	*4*	***141***
Cross-border	*–*	*36*	*–*	*7*	*31*	*22*	*2*	*0*	*–*	*–*	*–*	***857***
Sub-total	**1,057**	**1,129**	**3,086**	**177**	**266**	**220**	**22**	**0**	**–**	**1,333**	**–**	**7,434**
Total OTC options	**2,054**	**2,170**	**5,841**	**303**	**558**	**408**	**41**	**0**	**36**	**2,525**	**231**	**14,166**
Total FX contracts	**23,292**	**23,723**	**46,274**	**6,708**	**10,276**	**5,956**	**2,952**	**781**	**1,107**	**25,430**	**5,839**	**152,339**

Recent changes to the national accounts, balance of payments and monetary statistics

By Anna Brueton of the Office for National Statistics and John Thorp of the Bank's Monetary and Financial Statistics Division.

In September 1998, the Office for National Statistics made major changes to the presentation of the UK National Accounts. This article summarises these changes and complementary changes to the balance of payments statistics and to the banking and monetary statistics produced by the Bank. The November Inflation Report *contains a description of the impact of the changes on the National Accounts, and an assessment of the UK economy based on the new data.*(1)

Introduction

In September 1998, the Office for National Statistics (ONS) introduced the most extensive changes to the UK National Accounts since the first publication of the national income and expenditure 'Blue Book' in 1952. These changes followed revisions to international standards, and harmonised the statistics that the ONS publishes for international and domestic purposes. Previously, these were produced on the basis of different accounting standards, which could be confusing for those who wished to make inter-country comparisons. GNP and its components were reported using the European standard, ESA 1979, but statistics for domestic purposes were based on a version of the United Nations' System of National Accounts (SNA) 1968, adapted as economic circumstances required. The changes include the adoption of a new, internationally agreed, system of national accounts and balance of payments. Parallel changes have been made in the banking and monetary statistics produced by the Bank.

In addition, a number of other significant changes are implemented in this year's Blue Book. Price and volume series have been rebased to 1995 = 100; survey data grossed from a more comprehensive register of businesses are included in the National Accounts for the first time; and there are extensive methodological changes and data revisions, including a new approach to measuring the output of the public sector.

Overview of the new accounting system

The new system is an internationally compatible accounting framework, providing a systematic and detailed description of the UK economy. The framework consists of two sets of tables: the sector accounts and the accounts by industry.

- The *sector accounts* provide, by institutional sector, a description of the different stages of the economic process, from production through generation, distribution and use of income, to capital accumulation and financing. In addition to the financial transactions accounts, the system also contains opening and closing balance sheets, and several different types of revaluation and other changes identified in moving from the opening to the closing balance sheets.(2)

- The *accounts by industry* and the input-output framework describe the production process and the flow of goods and services in more detail. They provide all the elements needed to compile, in current prices, such aggregates as gross domestic product (GDP), gross national income (previously called gross national product), saving and the current external balance (the current account of the balance of payments). They also give the framework for a system of volume and price indices, so that constant-price aggregates can be produced.

The main changes to the National Accounts

The new system reflects the changing role of government, the increased importance and sophistication of service industries, and the increased diversity of financial instruments. It recognises a wider scope for capital formation, with new concepts such as intangible assets, valuables, and work-in-progress on services. The main changes are to the accounting structure (including some changes to terminology), the coverage of some key concepts, and the institutional sectors.

(1) More detail of the changes to the National Accounts and the balance of payments is given in an article in *Economic Trends*, August 1998, and in the *United Kingdom National Accounts Blue Book* and five other complementary publications by the ONS in September 1998 (see box on page 367). Material on the changes to the banking and monetary statistics was published in *Bank of England: Monetary and Financial Statistics ('Bankstats')* in September 1997 (on the review of the banking statistics), February 1998 (quantification of the changes, and an account of additions to published data), May 1998 (the new 'monetary financial institutions' sector, and central bank subsector), August 1998 (the banking sector's contribution to the balance of payments), September 1998 and October 1998 (the timing of the changes to the Bank's statistics).

(2) Neither these revaluations and other changes nor full non-financial balance sheets are shown in the 1998 Blue Book. Non-financial balance sheets for the public sector will be published later in 1998, with those for the whole economy available towards the end of 1999.

Background

National accountants have for a long time been keen to ensure that common standards are met as far as possible. The first Blue Book was published in 1952 (though national accounts information had been available in a succession of White Papers from the early 1940s). This was followed by the Balance of Payments Pink Book in 1960. Although the size of both publications increased over time, the format remained little changed.

The United Nations and the Statistical Office of the European Community (Eurostat) have each established systems, which have evolved over time in response to economic developments. The most recent revisions were the United Nation's System of National Accounts (SNA) 1993, and Eurostat's European System of Accounts (ESA) 1995. Major issues considered for new treatment in ESA95 and in SNA93 were the accounting and sectoral framework, the separation of price and quantity changes and the measurement of growth, the boundary between intermediate and final consumption, and the treatment of new financial instruments. SNA93 is also completely consistent with the most recent common methodologies developed for balance of payments accounting (set out in the manual referred to as BPM5), in which the International Monetary Fund has played the leading role. There were several inconsistencies between BPM4, the edition previously used in the United Kingdom, and SNA68, which caused problems for countries seeking an integrated approach.

The SNA has no legal basis; countries may use as much of it as they wish, and even within the framework it provides there can be a wide range of practices and presentation between countries. Currently, Member States of the European Union are required to submit GNP data to the European Commission annually on an ESA79 basis, as part of the determination of Member States' contribution to the EU budget. The new legislative requirements of ESA95 are much more extensive;(1) Member States are required by regulation to produce a full set of sector accounts, an input-output framework and accounts by industry, to a timetable that spans 1999–2003.

(1) Council Regulation (EC) No. 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community.

The accounting structure

For each sector, current-price accounts run in sequence from the production account through to the financial balance sheet. From the production account (account I) down through the capital account (account III.1), the closing balancing item required to balance uses (transactions that reduce economic value) against resources (transactions that add to economic value) is carried down as the opening resource entry in the next account. For the whole-economy account, there is an extra account at the beginning of the system for goods and services used and produced in the economy (account 0). A similar account is shown for the rest of the world.

I Production account

II Distribution and use of income account
- II.1 Primary distribution of income
  - II.1.1 Generation of income
  - II.1.2 Allocation of primary income
- II.2 Secondary distribution of income
- II.3 Redistribution of income in kind
- II.4 Use of income
  - II.4.1 Use of disposable income
  - II.4.2 Use of adjusted disposable income

III Accumulation accounts
- III.1 Capital account
- III.2 Financial account

IV Balance sheets

The production account records the activity of producing goods and services. Its balancing item is value-added.

The distribution and use of income accounts show how incomes are generated by production, distributed to those who have claims on the value-added created by production, redistributed (mainly through social security contributions, benefits and taxes), and eventually used by households, government or non-profit institutions for final consumption or saving.

The accumulation accounts record the acquisition and disposal of assets and liabilities—in the capital account for non-financial assets and in the financial account for financial assets.

The 'rest of the world' account is equivalent to the 'rest of the world' sector in the main accounts. The accounts for the whole UK economy as a unit and for its counterpart, the rest of the world, follow a similar structure to the UK sectors, although several of the rest of the world accounts are collapsed into a single account because they can never be complete when viewed from a UK perspective.

Changes in terminology

There is a variety of new terminology in the new system. This is also being adopted by the United Kingdom, to avoid ambiguity. For example, stocks are now called 'inventories'; the term 'stock' is used only to denote a level of an asset or liability in a balance sheet. Consumers' expenditure is replaced by two components: 'household final consumption expenditure', and 'final consumption

expenditure of non-profit institutions serving households'. Income from employment becomes 'compensation of employees'. Some of these terms may sound awkward or unfamiliar, but the change is a prerequisite for greater international comparability.

Changes to some key concepts

Headline GDP

The key indicator of the state of the economy, which provides the headline in the GDP and quarterly National Accounts first releases, was previously quarterly growth in GDP at constant factor cost. Value-added is now measured at 'basic prices', instead of at factor cost. Whereas 'factor cost' excludes all taxes less subsidies on production, the basic-price valuation excludes taxes less subsidies on products (such as VAT and import duties), but includes other taxes less subsidies on the process of production (such as vehicle excise duty and property taxes). UK statistics (and those of other EU countries) will use GDP at constant market prices as the main indicator of output in the economy.

Although factor cost does not form part of the new system, the components needed to calculate it are still available. The ONS will continue to provide gross value-added at current and constant factor cost if there is sufficient demand from users of the statistics.

Capital formation

The scope of capital formation has been extended in various areas of the new accounts. There are some completely new entries in the accounts, and spending on these is redefined as capital expenditure rather than as intermediate consumption. The overall effect is an increase in measured GDP. Expenditure in the following areas has been reclassified as capital expenditure:

- *mineral exploration*—the value of expenditure on exploration for petroleum and natural gas and for non-petroleum deposits, including unsuccessful exploration.

- *cultivated assets*—included as gross fixed capital formation (GFCF) for the first time in the UK accounts, though they were within the scope of ESA79. They cover assets yielding repeat products (eg milk and fruit); items used up in the process of production, such as cattle slaughtered for meat, are not included in GFCF.

- *entertainment, literary and artistic originals*—the original films, sound recordings, manuscripts, and tapes etc in which repeat performances are embodied.

- *computer software*—including purchased software and 'own-account' software developed by organisations for their own use.

- *work-in-progress in the service industries*—recognising for the first time that the production of some services may extend over several periods in the statistics.

- *valuables*—defined as produced assets not designed for production or consumption, which are acquired and held primarily as a store of value, such as works of art.

Treatment of insurance

In the statistics, income from the investment of 'insurance technical reserves' (ie insurers' earnings on funds held for the benefit of their policyholders) now contributes to the value of services shown as produced by the insurance industry, along with actual premiums received from policyholders.

Property income and accruals

The new standards advocate use of accruals throughout. In a few instances, the European Union may decide to adopt cash recording as an approximation to accruals.

Financial intermediation services indirectly measured ('FISIM')

A major innovation of SNA93 is the recognition that the way in which financial institutions charge for their services often depends on how they set their interest rates, as well as on any explicit charges they make. Interest paid to depositors is lower than it might otherwise be, and interest charged to borrowers is higher than it might otherwise be, to cover all or part of the cost to the financial intermediary of providing these services to customers.

The national accounting system has always aimed to record these charges as services, by making an adjustment for financial services equal to the balance of interest receipts less interest payments by financial intermediaries—a measure of the services produced by those institutions; the principle of this measurement is not very different from the principle of measurement used for distributors of goods. These services have then been treated as being used by a notional industry or sector, in the form of intermediate consumption, so that GDP has been unaffected. The intention in SNA93 and ESA95 is eventually to allocate FISIM to actual users, and dispense with the convention of a notional sector. This allocation has not yet been implemented, but will be done within an experimental supplementary account.

The distinction between taxes and services in the government sector

The new system distinguishes more specifically between taxes and charges for services provided by government. Broadly, if some kind of service is being provided in return for the payment, provided that the payment is not out of proportion to the cost of the service, then the payment should be treated not as a tax but as a payment for a service.

For instance, the cost of a passport is in line with the service provided by government in carrying out the necessary checks on the applicant's right to obtain and use a passport in the given name. But Independent Television Corporation franchise payments are compulsory and out of proportion to the service provided, and hence regarded as taxes. Similar considerations apply to subsidies.

Some taxes that had formerly been treated as charges for services—notably domestic rates and vehicle excise duty—are now classified as taxes on income and wealth. This reduces household final consumption expenditure. For domestic rates, the effect is a substantial reduction in 1990 and earlier years at current prices. At constant prices, the volume of housing services being consumed remains the same.

Rent

Previously, rent on land was included with rent on buildings, and the land on which they stand, as a component of value-added. The term 'rent' now covers only rent on land (mainly agricultural land) and rent on sub-soil assets, as components of 'property income'. Most other payments on land and buildings together are now regarded as composite payments for services, eg housing services. As most rented buildings cannot be separated in any meaningful way from the land on which they stand, the whole payment is treated as rental payments for services.

Changes to the institutional sectors

The economy is subdivided into institutional sectors, similar but not identical to those previously used:

- Non-financial corporations
  - Public non-financial corporations
  - Private non-financial corporations
- Financial corporations
  - Monetary financial institutions
  - Other financial intermediaries etc
  - Insurance corporations and pension funds
- General government
  - Central government
  - Local government
- Households and non-profit institutions serving households(1)
- The rest of the world

Important changes are:

- the central bank, comprising the Issue and Banking Departments of the Bank of England, is a new subsector within monetary financial institutions;
- partnerships, formerly classified within the personal sector, are now 'quasi corporations', included within the corporate sectors;
- insurance corporations and pension funds form a new subsector within the financial corporations sector.

Complementary changes to the balance of payments

A revised presentation of the balance of payments is also being implemented according to the fifth edition of the Balance of Payments Manual (BPM5).(2) BPM5 was written by the International Monetary Fund in conjunction with SNA93, and so is consistent with ESA95.

The new manual sets out major changes to structure and terminology, bringing the balance of payments explicitly into line with the National Accounts, as well as including greater detail on services and financial instruments. Thus a new 'financial account' incorporates much of the previous capital account, setting out the financial transactions that complement the redefined current and capital accounts. The current account now excludes the capital transactions that are in the new capital account. These mainly comprise capital transfers, as well as acquisition/disposal of non-financial non-produced assets.

Within the current account, the most significant changes are to the 'trade in services' account. Although the coverage of trade in services remains broadly unchanged, its presentation is completely new. Data are now presented in terms of products, or type of service, rather than in terms of the industry of the UK transactor. In addition, the data are broken down into considerably more detail than under the old presentation.(3) The expanded samples required to collect the more detailed product information have led to improved trade in services data. Also within the current account, compensation of employees is shown as a separate income transaction, rather than implicitly included within trade in services, as under the old presentation.

The level of detail of financial instruments provided in the financial account has also increased. For example, money-market instruments such as commercial paper and certificates of deposit are now shown within portfolio investment. These instruments were previously included indistinguishably within the transactions of UK residents other than banks and general government.

The threshold determining foreign direct investment has been reduced: non-resident ownership of 10% or more of a company now constitutes 'direct' investment, rather than 20% as previously. The amounts involved in this change are negligible, and since the change is a switch from portfolio investment to direct investment, the overall effect on the United Kingdom's position with the rest of the world is zero.

(1) The ONS plans eventually to separate households from non-profit institutions. In the banking and monetary statistics, these two subsectors can be distinguished from end September 1997 onwards.
(2) The particular effects of all the changes on the banking sector's contribution to the balance of payments was discussed in an article in the August 1998 issue of '*Bankstats*'.
(3) Data have been collected on the new product basis since 1996. Historic data prior to this can be derived only at the broad aggregate level.

A further change relates to the Channel Islands and the Isle of Man. These are now excluded from the 'United Kingdom', since they have their own governments. This in principle increases flows to and from abroad—but in practice, there was incomplete coverage of the islands within the 'United Kingdom' in the previous system.

Complementary (and other) changes to the banking and monetary statistics

The data collected by the Bank of England from banks and building societies (via the Building Societies Commission) are designed to provide input not only to the aggregate banking and monetary statistics compiled by the Bank, but also to the National Accounts family of statistics compiled by the ONS. The banking and monetary statistics can therefore be seen as a subset of the National Accounts family.(1)

Changes have therefore been made to the definitions of the data collected from the banks and building societies, and to the way the aggregate statistics are put together, to implement the new international standards.(2) At the same time, the opportunity given by the wide-ranging review of the banking statistics was taken to make other worthwhile improvements.(3)

Sectorisation

The institutional sectors have been modified in the same way as in the National Accounts more generally. The main areas affected in the banking and monetary statistics are:

- There was a drop in the level of M4—and of equivalent totals within the aggregate banking and building society statistics—at end September 1997 (the date at which this redefinition was made in these statistics), because of the redefinition of the UK offshore islands as non-resident and therefore as part of the 'rest of the world' sector. So holdings of deposits by residents of the islands now count as non-resident holdings and, more importantly for the effect on M4 and similarly defined aggregates, deposits held at banks on the islands count as deposits abroad. A comprehensive total for deposits held by the M4 holding sector at banks in the islands is now included in the published table of 'liquid assets outside M4'.

- Partnerships were transferred from the personal to the financial or non-financial corporate sectors, again from end September 1997. Within the remaining 'household sector', households themselves are distinguished from non-profit institutions serving households—and unincorporated businesses such as sole traders can be distinguished to the extent that the reporting institutions can distinguish them.

- The new 'monetary financial institutions' sector includes the Bank of England's Issue Department (which was previously classified as in the public sector), as well as the Bank's Banking Department, the other banks and the building societies. A separate central bank subsector is now identifiable from April 1998 in the 'monetary financial institutions' statistics; but no change is needed to the statistics for M4 and its counterparts, as these were already compiled on this basis.

Frequency of sectorisation of M4 and its lending counterpart

Because of the likelihood that motives for holding money and for borrowing vary according to the institutional sector of the holders and borrowers, the statistics of M4 and lending are now (from July 1996) fully sectorised monthly, instead of only quarterly.

Industrial analysis

From end September 1997, the industrial analysis of bank lending has been based on the latest standard industrial classification already used elsewhere in UK statistics (SIC 1992). From end 1997, a parallel analysis of bank deposits has been introduced.

Treatment of financial instruments

Adoption of the new international standards has led to the following changes:

- *Acceptances* have been brought onto the balance sheet of the accepting bank (ie a bank accepting a bill is regarded as having a liability to the bill's owner, and a claim on the party whose bill the bank has accepted). This brings accepted bills owned by holders outside the monetary financial institutions sector (the 'bill leak') into 'deposits' (ie into M4, if they are owned by the M4 holding sector) and into bank lending. As the bill leak is usually small, the impact on M4 and lending is generally negligible.(4)

- Amounts outstanding of *securities and other investments* are now reported at *market* value wherever appropriate and possible. These were previously reported at 'book' value, which could be an historic value.

- The current market value of derivatives contracts is now included on balance sheets. In the monetary

(1) The ability to identify M4, the main broad money aggregate, has however been lost, at least temporarily, in the National Accounts, because the financial accounts (within the National Accounts) no longer distinguish sterling from other currency deposits. And adjustments made by the ONS to produce a run of back-data on the new basis (particularly in respect of the classification of the UK offshore islands in the 'rest of the world') have not been carried through to the banking and monetary statistics.
(2) There is at present no agreed standard for monetary statistics. But an advisory manual being drafted by the International Monetary Fund is likely to be consistent with the existing international statistical accounting standards (the System of National Accounts etc), as a matter of principle.
(3) A fuller description of the changes and their timing is given in the articles and notes in '*Bankstats*' referred to in footnote (1) on page 361.
(4) The revised treatment has so far been carried back only to end September 1986, so does not cover those periods in the 1970s and early 1980 when disintermediation, particularly in the form of the bill leak, was boosted by the constraining effect of the 'corset' on banks' balance sheets: see the article on 'The supplementary special deposits scheme', *Bank of England Quarterly Bulletin*, March 1982, pages 74–85.

statistics, these values are now included on a net basis in 'net non-deposit liabilities'. Gross figures are being collected, but the precise way in which they should be used in the monetary statistics and the UK financial accounts is still being considered, as this is a new and complex area of reporting. Though bank liabilities in respect of derivatives contracts do not have enough of the characteristics of 'money' to be included in M4, assets in respect of at least some types of contracts may be appropriate for inclusion in 'lending', given its broad existing coverage of bank and building society assets.

Two other significant improvements are:

- More detailed analyses of mortgage approvals and repayments are now available, primarily to illustrate how much of new lending is remortgaging.(1)

- A more robust survey of interest rates has been launched from October 1998, to provide firmer estimates for the sectorisation of bank interest flows in the National Accounts and—because the data are monthly and more timely than the previous quarterly series—to aid the analysis of the monetary and lending statistics.

Other changes to the National Accounts

Rebasing

From September 1998, constant-price estimates in the United Kingdom were published for the first time on a 1995 price base, rather than the previous 1990 price base. Regular five-yearly rebasing improves estimates of growth in more recent years, by ensuring that recent volume comparisons are not distorted by using a price structure from an earlier period.

Rebasing does not mean that the whole series of constant-price estimates is recalculated using the relative weights of the new base year. This would mean imposing inappropriate weights for earlier periods. Instead, a year between the old and new base year is chosen as the link year. For years before the link year (1994), data are re-scaled to the new price basis; only periods from the link year onwards are recalculated, by rebasing all the constituent series and re-aggregating. For periods up to the link year, no changes in growth rates arise from the rebasing; after the link year, growth rates may be altered by the rebasing.

Introducing the new business register

A further significant change in this year's Blue Book is the inclusion of survey data based on the Inter-Departmental Business Register (IDBR), which was introduced in 1996 for the selection of samples for all business surveys, and as the basis for grossing to population totals.(2) The IDBR replaces the existing business registers, providing a common register from which business surveys are selected. VAT and PAYE data are the main sources used to update it. The IDBR is consequently much more comprehensive than previous registers; gaps and double-counting between surveys are eliminated. For the National Accounts, it was important to ensure that the register effects were introduced for all surveys at the same time, and that estimates were properly linked to pre-1996 data through the input-output framework.

Linking to early data has not been straightforward. It would not have been correct simply to raise the figures uniformly, as early data already included adjustments for lack of coverage. The process has been to reassess data back to the 1980s, to the period where these adjustments are most firmly based. The effect has been to raise the level of GDP, but the effect on growth rates is generally small.

Measuring government output

The ONS has been developing an improved methodology for measuring government output at constant prices. This measures outputs rather than inputs, and so—unlike the previous method—takes account of productivity changes. The new methodology is now applied to education, health and social security (around 50% of the public sector) using a range of performance indicators, such as pupil and student numbers for education; a cost-weighted activity index for hospital output; and numbers of benefit claims for social security.(3)

Other long-run revisions

EU directives require all members to improve their estimates of GNP, which form the basis for assessing part of their contributions to the EU budget. One of the areas where improvements are required is 'exhaustiveness'—ensuring full coverage of the accounts. The implementation of the IDBR is part of the UK contribution to this process. As part of the same process, an improved methodology has been adopted for estimating the evasion adjustment for incomes not declared to the Inland Revenue. In addition, the general revision led to improvements to basic data sources, which have helped to improve the coverage of the accounts.

The preparatory work for implementing ESA95 required a thorough scrutiny of present National Accounts methodology, which identified areas where there was scope for improvements. The ONS therefore took the opportunity to put through extensive long-run revisions this year to improve the accounts and provide a sound basis for the transition to ESA95. These revisions have produced a more coherent set of accounts and reduced the need for balancing adjustments overall: a major quality improvement.

(1) See the article in '*Bankstats*', September 1998.
(2) For more details on the introduction of the IDBR, see 'Improvements to business inquiries through the introduction of the new Inter-Departmental Business Register', *Economic Trends*, February 1998.
(3) For an account of the methodology and of the further work planned, see 'Measuring the output of non-market services', *Economic Trends*, October 1998.

Rebalancing GDP: revisions

Conceptual changes from the implementation of ESA95 that affect GDP are in principle balanced: each measure of GDP—expenditure, income and output—is affected to the same extent. For example, under the new treatment of spending on software by non-government enterprises, 'intermediate consumption' becomes capital expenditure. The change adds to expenditure through the increase in gross fixed capital formation. The reduction in intermediate consumption produces an equivalent rise in gross operating surplus, and so in income. Value-added has also risen, in line with the reduction in intermediate consumption.

Many of the other revisions are not balanced across the accounts. For instance, the introduction of the IDBR affects the output and expenditure measures in different ways, and does not affect the data underlying the income estimates. For years to be balanced through input-output supply and use tables (1989–95), the process adopted has been to start with the non-ESA revisions, balancing these through the input-output framework, and then to take on the balanced ESA95 revisions. The result is a new picture of GDP at current prices, within which the ESA effects can be distinguished. For other, unbalanced, revisions, only approximate estimates can be made of the effect of each current price change.(1)

Benefits of the new accounts

Though the transition to the new accounts may be difficult for users of the statistics (as well as for the producers), there are clear long-term benefits. The accounts have a clearer framework and use more up-to-date concepts; there is better coherence within the GDP dataset, and consistency between the National Accounts and the balance of payments statistics; and international comparability will be much improved.

Publications

The first publication of the new National Accounts was on 24 September, with the issue of the quarterly National Accounts and Balance of Payments first releases and the 'family of publications', including the National Accounts Blue Book; the Balance of Payments Pink Book; National Accounts Concepts, Sources and Methods; Introducing the European System of Accounts 1995; Sector Classification for the National Accounts; and Input-Output Supply and Use Balances. Other ONS releases and publications have also been affected by ESA95 changes, rebasing or both; and equivalent changes have been introduced in statistics published by the Bank of England.

Future developments

The process of moving to ESA95 does not end with this year's Blue Book. There is a timetable for providing Eurostat with further data, which stretches until 2003 and beyond. Much of the additional detail concerns further industrial analyses, and sector and financial accounts.

Although one purpose of SNA93 is to improve the framework for distinguishing price and volume changes, the more specific ESA regulation adds little in this respect. The provisions of the European Stability and Growth Pact, which use growth in constant-price GDP as an administrative statistic, have given an impetus to this work. Proposals have now been agreed by Eurostat and EU national statistical institutes for work to harmonise constant-price methodology, including a move to the annual chain-linking of GDP. These proposals, and UK plans to implement them, will be described in a forthcoming edition of *Economic Trends*.(2)

(1) For a description of the impact of the revisions on GDP, see the box in the November 1998 *Inflation Report*.
(2) Further information on the National Accounts issues addressed in this article can be obtained through the National Accounts e-mail address: na@ons.gov.uk, or by fax on 0171 533 5937. For more information on the activities of the National Accounts User Group, contact the ONS by e-mail at naug@ons.gov.uk, or by fax on 0171 533 5937. A CD-ROM includes concepts, sources and methods, and the Blue Book tables. To order this or any ONS publications, contact the Stationery Office on 0171 873 9090.

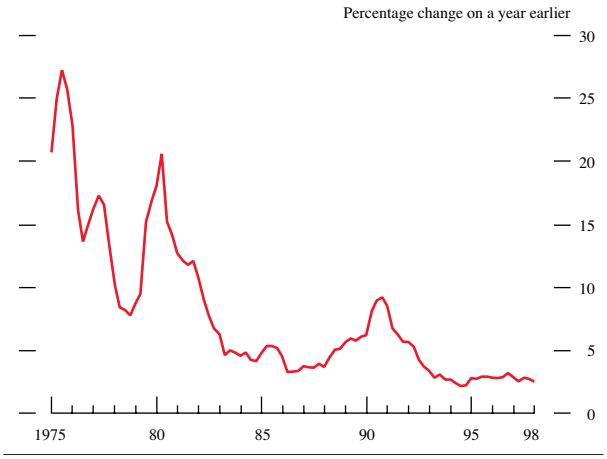
Inflation targeting in practice: the UK experience

In this speech,[1] John Vickers, Executive Director and Chief Economist at the Bank of England, discusses theoretical and practical issues relating to inflation targeting as used in the United Kingdom during the past six years. After outlining the role of the Bank's Monetary Policy Committee, he considers the Committee's task from a theoretical perspective, before discussing the concept and measurement of domestically generated inflation.

Introduction

Six years ago this week, sterling left the exchange rate mechanism (ERM) of the European Monetary System, and dropped by 7% from DM 2.80 to DM 2.60. But since falling below DM 2.20 in 1995, sterling has risen to levels higher than before its exit from the ERM. In an economy as open to international trade as the United Kingdom, one might have expected that such large swings in the price of foreign exchange would destabilise domestic price inflation. Not so. For every month since the start of 1993, inflation[2] has remained in a range of 2%–3½%. This is an uncharacteristic degree of UK price stability by recent historical standards (see Chart 1). Over the same period, annual GDP growth has averaged about 3%, well above trend, and the unemployment rate has fallen from 10% to 6.2%.[3]

Chart 1
RPIX inflation



For these six years, the United Kingdom's nominal anchor has been an explicit inflation target, and on 1 June this year, a new statutory framework for the implementation of price stability (and much else) came into force in the shape of the Bank of England Act 1998.[4] First, I shall briefly describe this framework, and how the operationally independent Monetary Policy Committee (MPC) works within it—how we make decisions, how we seek to explain them, and how we are held accountable for doing the job we have been given.

Next, though my task is to discuss inflation targeting from the practical perspective of UK experience, I shall take a detour and discuss a sort of converse question: how might UK practice appear from the perspective of the *theory* of inflation targeting? Then finally, and returning to the theme of inflation targeting in an open economy, I shall discuss the practical and topical problem of inflation control in the face of large exchange rate movements, and how the concept of domestically generated inflation may help in addressing it.[5]

The United Kingdom's new monetary framework

Almost immediately after coming into office, the new Government announced on 6 May 1997 that the Bank of England would henceforth have operational independence for the conduct of monetary policy. While the *objectives* of policy remain a matter for the Government to determine, responsibility for interest rate *decisions* moved to the Bank's new MPC. The MPC operated for a year on a *de facto* basis, and now has a statutory basis under the Bank of England Act. The Act also reformed the governance and finances of the Bank, and transferred responsibility for banking supervision to the new Financial Services Authority; the job of government debt management has moved to the Treasury.

The MPC has nine members—the Governor, the two Deputy Governors (David Clementi and Mervyn King), the Bank's Executive Directors for Monetary Operations (Ian Plenderleith) and Monetary Analysis (me), and four members appointed by the Chancellor of the Exchequer: Sir Alan Budd (formerly Chief Economic Adviser at the Treasury), Willem Buiter (Cambridge University), Charles Goodhart (London School of Economics), and DeAnne Julius (formerly Chief Economist at British Airways). Our monthly policy meetings span two days, and decisions are taken by a vote, with the Governor having a

(1) Given at the Conference on Implementation of Price Stability held in Frankfurt on 11–12 September 1998.
(2) As measured by the retail price index excluding mortgage interest payments (RPIX).
(3) On the Labour Force Survey measure.
(4) The Act is described in more detail in the May 1998 *Quarterly Bulletin*, pages 93–99.
(5) I am very grateful to Bank of England colleagues Bill Allen, David Barker, Willem Buiter, Spencer Dale, Andrew Haldane, Graham Kentfield, Mervyn King, Ben Martin, Paul Mizen, Jo Paisley and Chris Salmon for their helpful comments and suggestions on an earlier version. The views expressed are entirely my own, and are not necessarily those of other MPC members, or of the Bank more generally.

casting vote in the event of a tie. A representative from the Treasury attends.

The paramount statutory duty of the MPC is the maintenance of price stability. This is defined in terms of a target for the annual rate of retail price inflation excluding mortgage interest payments (RPIX). The Chancellor's letter of 3 June 1998 defining the MPC's remit says that 'the inflation target is 2½% at all times'. The remit recognises that exogenous shocks and disturbances may cause inflation on occasions to deviate from the target, and that 'attempts to keep inflation at the inflation target in these circumstances may cause undesirable volatility in output'. If the target is missed by more than 1 percentage point on either side, the Governor, as chairman of the MPC, must write an open letter to the Chancellor explaining why the target was missed and what action is being taken to rectify the situation. Subject to the paramount statutory duty of price stability, the MPC must support the Government's economic policy, including its objectives for growth and employment.

There are two main vehicles of transparency: the minutes of the monthly MPC meetings and the quarterly *Inflation Report*, the twenty third of which was published last month. The minutes give a frank but non-attributable account of the Committee's discussion, and individual votes are recorded.

The *Report*, which is prepared by Bank staff under the guidance of, and with the approval of, the MPC, offers a detailed account of recent economic developments, and gives projections for inflation and GDP growth up to a two-year horizon.

Charts 2 and 3 show the 'fan chart' projections from the August *Report*, assuming constant interest rates. The fan charts are explicit about the Committee's (best estimate of its) uncertainty about the future. The shading is rather as on a contour map: at each point in time, the darkest region contains the central projection or highest probability path (ie the mode) and covers 10% of the probability, while paths considered decreasingly likely are in the correspondingly lighter regions that fan out. The uncertainties around the central projection are not necessarily symmetric—eg there is some upward skew in the inflation fan chart—and so the mode, median and mean may well differ. More on this later.

The minutes and the *Reports* are also important for accountability to the public generally, and specifically to the Bank's Court of Directors, to the Government, and to the Treasury Committee of the House of Commons. MPC members regularly give evidence before the Treasury Committee, and in June this year there were (non-statutory) confirmation hearings. I am pleased to report that we all passed.

Chart 2
Inflation projection

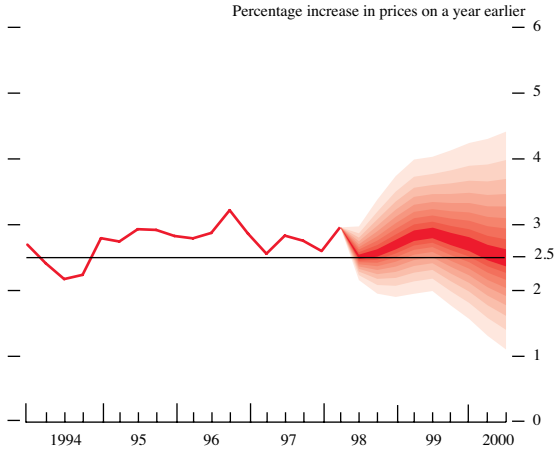
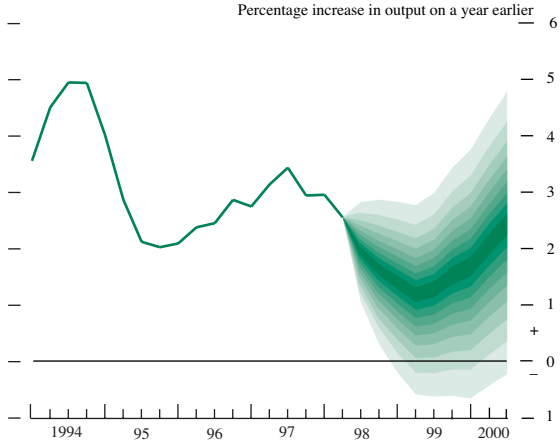


Chart 3
GDP projection



Source for Charts 2 and 3: August 1998 *Inflation Report*.

UK inflation targeting from a theoretical perspective

How might an academic surveying the United Kingdom's new monetary arrangements from the supposedly ivory towers describe the MPC in theoretical terms? I imagine that this academic would seek to define our objective in terms of a loss function,(1) and our behaviour in terms of an associated reaction function that relates policy decisions to economic data.(2)

The loss function

It should go without saying that the MPC's objectives are given by the Act and by the remit set by the Chancellor. There is a large literature on inflation bias,(3) but it is simply not applicable to the MPC. We have no desire to spring inflation surprises to try to bump output above its natural rate (wherever that may be). Quite apart from the obligation to fulfil our statutory duty, we have the strongest professional and reputational incentives, which in my

(1) Summed over time and appropriately discounted.
(2) This hypothetical academic might also delve into the theory of voting, but let me not get into that.
(3) Stemming from Kydland and Prescott (1977), and Barro and Gordon (1983).

opinion are incapable of being enhanced by financial incentives, to get as close as we can to the inflation target.

The academic knows this, but has two questions. First, is inflation the only thing that the MPC cares about—ie are we 'inflation nutters'? Clearly not: the remit from the Chancellor explicitly recognises that output volatility can be undesirable. Thus, as discussed by King (1997), the inflation target certainly does not ignore output. So how fast should the MPC try to return inflation to target following, say, an adverse supply shock? That depends on the cost of output volatility (around the natural rate of output) relative to the cost of inflation volatility (around the inflation target). The MPC's remit is silent on this parameter of the loss function, but optimal policy is arguably not too sensitive to its value within a reasonable range.(1)

Concern about output volatility is also one way of embracing the growth and employment objectives that are statutorily subsidiary to the main objective of price stability, which itself is of course a principal means of *promoting* growth and employment: the real world works best when inflation is under control.

The academic observer does not put any more ingredients into the loss function imputed to us, eg by including interest rate smoothing as an objective, though smooth-looking interest rate paths might result from optimal policy, for example because of the lag structure of the economy.(2) Neither are monetary aggregates put into the loss function, though we might watch them like hawks.

The academic's second question is interestingly abstract: what is the shape of the loss function? There is every indication (eg from the 1% letter-writing thresholds) that, at least as far as inflation is concerned, losses are symmetric: being 0.6% above the target is neither better nor worse than being 0.6% below it. But other things being equal, how much worse is it to miss the target by 1.2% rather than by 0.6%? Possible answers include:

(a) infinitely worse (graphophobia),
(b) four times as bad (quadratic loss function),
(c) twice as bad (linear loss function), and
(d) equally bad (perfectionism).(3)

As to case (a), I should first correct the popular misunderstanding that graphophobia is the fear of graphs. In fact, it is the fear of writing—specifically the fear of having to write a letter to the Chancellor explaining why the inflation target has been missed by more than 1%. But to suppose that MPC members are graphophobes would surely be to confuse their objective with a means of their accountability.

The theoretical literature mostly, and not unreasonably, assumes case (b). As is well known from the work of Svensson (1997) and others, with inflation as the only objective and with additive uncertainty, the optimal intermediate target in case (b) is simply the forecast *mean* of inflation at the policy horizon (eg two years ahead if policy takes two years to be effective). Under the same assumptions, case (c) makes the *median* of the inflation projection the optimal intermediate target, while the perfectionist in case (d) generally targets the *mode* in order to maximise the probability of perfection.

Thus the assumed shape of the loss function influences which measure of expected inflation is the intermediate target. If probability distributions for inflation are asymmetric, the differences between these measures can matter in practical terms, and things are complicated further when uncertainty is non-additive—see below. And it must be remembered that the appropriate expectations about future inflation are *conditional* upon the information available. This brings us to the question of the reaction function.

The reaction function

King (1997) looked forward to the day when monetary policy would be boring: the news would be in the data, not the authorities' reaction to the data. Perhaps in the long run we are all boring, but the MPC has not yet achieved that nirvana. Indeed, the 25 basis point rate rise on 4 June 1998 apparently surprised the markets so much that it caused the short-term interest rate futures contract to move by more than 25 basis points.(4)

How boring can we aspire to be? Regretfully, I suspect that there are fundamental limits. Consider the relatively simple world of so-called 'strict' inflation targeting(5) and additive uncertainty, where optimal policy targets the mean of future inflation. This expectation is conditional upon everything that the policy-maker knows and believes, including the policy-maker's own analysis, and not all that information is in the public domain. While transparency—*Inflation Reports*, MPC minutes, Treasury Committee hearings, and so on—increases what is in the public domain (desirably in my view), there is surely information relevant for policy-making that is simply incapable of being put in the public domain. In that case, and with the best will in the world, optimal monetary policy cannot be absolutely transparent, nor totally boring.

An analogy with contract theory might be useful. As Williamson (1985) and others have shown, in situations of any complexity, there is a tension between a complete contract (ie one that specifies what is to happen in every eventuality) and having a good contract (ie one that entails good decisions in every eventuality). If the same is true for

(1) See Bean (1997), and Haldane and Batini (1997).
(2) See Sack (1998), and Goodhart (1998).
(3) A functional form for the loss function that encompasses all these cases (and many others) is $L(x) = x^{\alpha}$, where L is the loss, x is the deviation from target, and α is zero in case (d), one in case (c), two in case (b), and approaching infinity in case (a). But the strictly graphophobic version of case (a) has $L(x) = 0$ for $x \leq 1$ and $L(x) = k > 0$ otherwise. With additive uncertainty, optimal behaviour for a strict graphophobe generally has equal probabilities of inflation being exactly 1½% and exactly 3½%.
(4) Some were surprised at this degree of surprise, in view of the facts that the recent data had clearly worsened the prospects for inflation, and that the most recently published minutes showed that three of the (then eight-person) Committee had favoured a rise in April.
(5) 'Strict' in the sense that inflation is the only argument in the loss function.

policy reaction functions, then residual discretion is sensible and so residual uncertainty is inevitable. (Moreover, MPC decisions aggregate the views of nine people, each of whom carries individual responsibility for his or her vote.)

For example, if model forecasts were used mechanically to generate interest rate decisions, then the policy reaction function could be put in the public domain by publishing (i) the model equations, and (ii) the data series fed into the model. The Bank is indeed planning to publish information about the models and data used in making the projections for inflation and growth, but for a number of good reasons this will not—indeed cannot—amount to publishing a policy reaction function.

First, as already stated, some information relevant for policy simply cannot be put into the public domain. One illustration of this point is the valuable information gathered by the Bank's twelve regional Agents, which cannot all be published in detail, not least because the Bank would not then be given much of the information to start with.

Second, models that are sufficiently manageable to understand for policy purposes use only a small subset of the information that is in the public domain. The rest should not be ignored, but would be ignored by mechanistic forecasting. An indication of the significance of this point is that while the Bank's core forecasting model has about 150 variables, the chart packs for the 'pre-MPC' briefing meetings (on the Fridays before the monthly policy meetings of the MPC) contain about 500 charts and tables on a thousand or so variables.

Third, it follows not that we need a bigger model, but that disciplined judgment is needed in applying the (continuously evolving) models that we have. A key part of that discipline comes from other models alongside the core forecasting model, which inform the inputs to the core model and/or the interpretation of outputs from it.

Fourth, the structure of the economy is not stationary: it is always evolving (eg consider the NAIRU). Mechanistic use of a forecasting model, whose equations necessarily reflect past relationships, would risk ignoring aspects of structural change. Again, there is a need for (disciplined) judgment—for example, in adjusting equation residuals in the light of the analysis of other models, in conjunction with the core forecasting model. The models are simply tools to assist the Committee in forming its view about the prospects for inflation and growth.

Thus, good forecasting generally entails use of off-model information (ie information outside the core model) and hence off-model models. Precisely how this is done seems to me to be literally indescribable in detail. While it may be perfectly sensible for the outside observer to model the MPC robotically, by ascribing to it a reaction function such as a Taylor-like rule,(1) and while long-run model simulations might otherwise make little sense, it therefore seems impossible and anyway undesirable for the MPC to attempt to specify or predict in formal terms its own future behaviour in terms of a reaction function.(2)

Indeed, the projections in the fan charts shown earlier are based on a simple assumption of constant interest rates up to the two-year horizon. Of course, this is not a prediction that rates will be constant for two years, even over the average of possible eventualities. It is just a working assumption for forecasting purposes.(3) Given that the MPC cannot sensibly postulate its own future policy reaction function, I am not sure what practicable alternatives there are, aside from the other fan charts shown in the *Inflation Report*, based on the time path of interest rates implied by the markets.

Mean versus mode

The hypothetical academic observer has one more question. The *Inflation Report* fan charts might give some the impression that the aspect of the probability distribution for inflation most relevant for policy is the central projection, or mode. It seems unlikely that the MPC have perfectionist objectives (see above), so why are they not targeting the mean, as most of the academic literature seems to recommend as the optimal policy? Given the skewed distributions for inflation published in recent *Reports*, this is by no means only an academic question.

One response might be to say that the question confuses presentation with substance. Fan charts are drawn, naturally enough, like contour maps, so the mode has *visual* prominence, but it does not follow that the mode determines policy. The distribution as a whole, and other moments of it, are taken fully into account. Though correct, this response perhaps raises further questions. For example, in the theoretical linear economy with additive shocks and quadratic objectives, presentation might be better focused on the mean rather than the mode, and the fan charts might even be drawn in a different way.(4)

A second response notes that the central projection is conditional on assumptions about exogenous variables, which may have asymmetric probability distributions. Suppose, to take a hypothetical example, that the most likely path for sterling (which of course is not entirely exogenous) is one of broad constancy, but that there is thought to be a chance of a substantial fall. If policy could respond to such a fall in time to keep expected inflation on target, then targeting the mean of inflation conditional on the assumed most likely case of broad constancy is consistent with the unconditional mean being above the target (on the working assumption, discussed above, of unconditional policy).

(1) Such a rule of course requires specification of the output gap, which is arguably the greatest unknowable of all. And as will be discussed further below, Svensson (1998) shows that optimal policy reaction functions under open-economy inflation targeting are not necessarily Taylor-like.
(2) Of course, the MPC says a great deal—in minutes, *Inflation Reports*, and so on—about which factors it sees as important for future policy, and why.
(3) It should be pointed out that the variance of the distributions depicted in the fan charts is based on empirical estimates for a period when policy was of course reacting conditionally to unfolding events. If policy really was fixed unconditionally, the variance would be greater than shown.
(4) For example, as suggested by Wallis (1998).

In this example, then, the mean of inflation could be on target, whether or not there is a fall in sterling. But it would be above target if sterling fell sharply and if policy ignored the fall. If, rather than being based on unchanged rates, the projection incorporated a policy reaction function, then mean inflation would be on target in both the contingencies in the example. But for the reasons given above, it is hard to see how the MPC—as distinct from an outside observer—can sensibly postulate a reaction function for itself.

And third, it must be remembered that, even with 'strict' inflation targeting and a quadratic loss function, the (conditional) mean of inflation is not necessarily the optimal intermediate target, unless uncertainty is additive. In the simplest one-shot control problem, with a quadratic loss function, the aim is to minimise the squared mean deviation of inflation from target plus the variance of inflation. Unlike the case of additive uncertainty, suppose that the variance of inflation is influenced by policy. Then the mean of inflation should be above/below target as the variance of inflation increases/decreases with tighter policy. This is the principle of Brainard uncertainty.(1)

As a stylised fact, the level and variance of inflation appear positively correlated. But it would be wrong to jump to the conclusion, even in the sort of example at hand, that the mean of inflation is optimally below target. The (apparently open) question is not whether the mean and variance of inflation are positively correlated in general, but whether they move in the same or opposite directions as policy varies, holding other factors constant.

Questions of this sort, posed in more realistic settings and possibly with other loss functions than in the simple example above, are interesting and potentially important. Brainard uncertainty is the subject of continuing research at the Bank of England, and a central theme of the forthcoming Keynes lecture by Goodhart (1998).

Domestically generated inflation

Let me turn finally from an academic perspective on the MPC to a practical problem that it has been facing: how great is the *domestic* inflationary pressure in the economy, and what are the immediate prospects for *imported* inflation?

The UK inflation target is specified in terms of retail price inflation (excluding mortgage interest payments). Overall inflation is a weighted average of domestic inflation and imported inflation. Imported inflation—ie inflation of the domestic currency price of imported goods and services—is strongly influenced by real exchange rate movements. Given the large real appreciation of sterling (and falls in world commodity prices) since mid 1996, the imported component of UK inflation has been negative in the recent past. But overall inflation has not fallen below target. Therefore, domestically generated inflation (DGI)—whatever that may be—must have been significantly above the target level. A central question for UK monetary policy has been whether domestically generated inflation can be brought down in time for overall inflation to stay on target, once the temporary restraining influence of external factors wears off.

But what exactly is DGI? How can it be measured? How does it relate to more familiar measures such as the GDP deflator? What economic content does DGI have for policy purposes? In briefly addressing these questions, I shall draw on the continuing work on DGI at the Bank of England by David Barker and Willem Buiter (1998), which contains a much fuller and more rigorous analysis.

In essence, DGI is the inflation rate that would prevail if there were no external shocks to the economy, such as large movements in the real exchange rate.(2) External shocks have direct effects (eg lower sterling prices of imported goods) and indirect effects (eg via lower demand for UK exports). It is not practical to answer the full hypothetical question: what would UK inflation have been if sterling had not appreciated? But one can attempt to obtain measures of DGI by removing the direct effects of exchange rate movements.

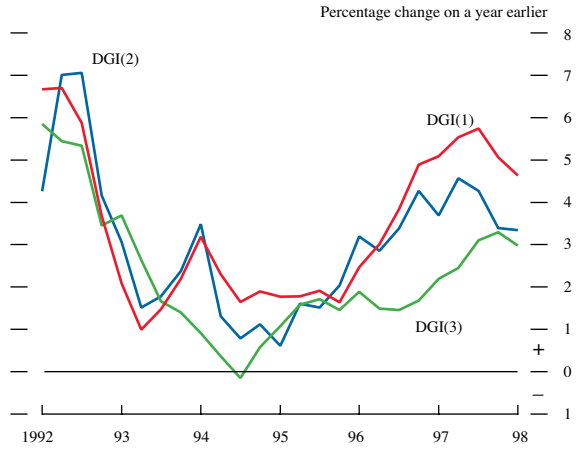
DGI differs from RPIX inflation primarily because import prices affect RPIX. Thus, imported French wine is a key ingredient of the UK retail product 'French-wine-in-UK-shops', and imported automotive components are often integral to 'cars-in-UK-showrooms'. This suggests RPIX excluding import prices as one measure of DGI. Input-output tables suggest that the (direct and indirect) import share of the RPIX basket is about 20%. This, together with the import price deflator from the National Accounts, allows calculation of the DGI(1) measure (coloured red) shown in Chart 4.

DGI differs from the GDP deflator primarily because the latter is the deflator for domestic value added overall—not just for domestic consumption.(3) This suggests that a second measure of DGI could be obtained by excluding the influence of export prices from the GDP deflator. (Care is needed here to take account of the import component of UK exports.) The resulting measure is shown as DGI(2) (coloured blue) in Chart 4.

A third measure can be obtained from unit labour costs. The rate of unit labour cost inflation measures DGI imperfectly, because (i) it may differ between the export sector and the sector producing for domestic consumption, and (ii) DGI should include unit profit growth in the domestic sector as well as unit labour cost inflation. A broad-brush argument suggests that (i) and (ii) may tend to offset each other. For example, exchange rate appreciation

(1) See Brainard (1967).
(2) DGI can be defined more specifically as the rate of inflation of the deflator for domestic value-added in production for domestic consumption.
(3) Another difference is that, unlike RPIX, the GDP deflator at factor cost excludes indirect taxes.

Chart 4
Measures of domestically generated inflation (DGI)



DGI(1): RPIX excluding import prices; DGI(2): GDP deflator excluding export prices; DGI(3): Unit labour cost inflation.

might (i) cause overall unit labour cost inflation to exceed domestic unit labour cost inflation, as labour productivity temporarily declines in the depressed export sector, and (ii) temporarily boost domestic profit margins, before lower import costs are fully passed through to consumers. There is a further question of whether overall unit labour cost inflation should be calculated on the basis of trend or actual measured productivity. Chart 4 shows unit labour cost inflation adjusted for trend productivity as DGI(3) (coloured green).

How have these measures of DGI evolved in the period since sterling left the ERM six years ago? As one would hope, they all fell substantially below RPIX inflation, before rising significantly above it following the sharp appreciation of sterling that began two years ago. The three DGI measures are currently in a range from about 3% to 4$^{1}/_{2}$%. As a matter of arithmetic, DGI will have to fall if the inflation target is to be met, once the restraining influences of external factors wear off.(1) So what?

The answer depends on how much inertia there is in DGI, and on the lags between monetary policy and DGI. Let me pursue these points by reference to Svensson's (1998) model of inflation targeting in an open economy.(2) In the aggregate supply equation (Phillips curve) of that model, DGI (so to speak) depends *inter alia* on lagged DGI, previous expectations of DGI, and output gap terms. Svensson does not attempt to calibrate or estimate his model, but the parameter on lagged DGI that he selects implies a significant degree of inertia in DGI.

The overall retail price index can jump discontinuously in the model, because exchange rate movements are assumed to pass through fully and immediately to domestic prices via import prices. The exchange rate, being determined by forward-looking expectations, reacts instantly to monetary policy. So there is no lag between policy and retail price inflation via the direct exchange rate channel. Of course, policy also affects the domestic and net trade components of aggregate demand, with a one-period lag, and aggregate demand affects domestic inflation, with a lag of a further period. So the model has a two-period lag between monetary policy and DGI.

The optimal reaction functions that Svensson (1998) obtains for open-economy inflation targeting are not like Taylor rules, and are sometimes counter-intuitive. For example, take the case of strict inflation targeting, and suppose that a recent shock means that DGI is expected to be above target next period. Sophisticated monetary policy exploits the powerful direct exchange rate channel to keep expected overall inflation on target, by engineering a rising real exchange rate path. By uncovered interest parity, this requires a policy of initially low, not high, interest rates.

Svensson is the first to point out limitations of the model, and corresponding directions for future work. Let me underline one of them—the timing, and indeed extent, of pass-through of exchange rate movements to retail prices. In recent UK experience, this is by no means instantaneous. First, it appears that foreign suppliers have widened their margins on exports to the United Kingdom as sterling has appreciated.(3) Second, it could be that domestic margins have widened on products with substantial import content.

Such behaviour is not surprising in theory. Contractual lags, the nature of oligopolistic interaction, and expectations that exchange rate movements may be temporary, are just a few of the reasons why margin adjustment might take time, or even remain incomplete. But theory has little to say about the likely lag structure. The challenges facing empirical work on this topic are also great, not least because of the difficulty of disentangling other (eg cyclical) influences on margins.

As for the theory of open-economy inflation targeting, a good question seems to be the robustness of optimal policy rules to uncertainty about the timing of exchange rate pass-through.

Conclusion

The United Kingdom has almost six years' experience of open-economy inflation targeting. During that time, inflation has been broadly stable, despite large movements in the sterling exchange rate, and hence in the substantial component of inflation that is imported.

The job of inflation targeting now rests with the operationally independent MPC of the Bank of England. Having outlined the way the MPC operates, I discussed

(1) This point does not depend on the accuracy of the three measures of the DGI. It follows simply from the fact that overall inflation has been above target, while imported inflation has been well below it.
(2) Another model of open-economy inflation targeting is given by Ball (1998).
(3) See Chart 4.2 on page 34 of the August 1998 *Inflation Report*.

what loss function, reaction function, and intermediate target an academic observer might ascribe to the MPC. One theme of that discussion was that it is inevitable that there will be residual uncertainty about monetary policy decisions, because the policy reaction function (so to say) in an ever-changing economic environment is incapable of being fully expressed. Therefore, monetary policy will never be completely boring.

I went on to discuss the concept and measurement of domestically generated inflation, which seems valuable for the analysis of open-economy inflation targeting. Among the issues calling for further research—both theoretically and empirically—are the apparently long and variable lags between exchange rate movements and pass-through to retail price inflation.

There is a story about the great English cricketer Geoffrey Boycott—a batsman never suspected of inflationary tendencies. A boy watching him go in to bat once shouted: 'Good luck Geoff!'. Whereupon Boycott allegedly retorted: 'It's not luck—it's skill'. Given the uncertainties facing open-economy inflation targeting, I am not sure that I would give quite such a categorical reply to well-wishers of the MPC—except, just possibly, with the benefit of hindsight six years from now.

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The objectives and current state of monetary policy

In an address to the TUC,[1] *the* ***Governor*** *outlines the objectives of monetary policy. These are not just to pursue low inflation for its own sake, but to keep overall demand consistently in line with the supply-side capacity of the economy in order to establish steadier growth, high levels of employment and rising living standards to be sustained into the medium and longer term. In that way, monetary policy can contribute indirectly to the supply side of the economy by creating an environment that encourages more rational, longer-term, decision-making throughout the economy.*

Turning to the current conjuncture, the ***Governor*** *comments on the dilemma caused by the imbalance between the domestic and internationally exposed sectors of the economy. He notes that the inflation target is symmetrical, and that a significant, sustained fall below 2½% is to be regarded just as seriously as a significant, sustained rise above it. Finally, the* ***Governor*** *points to evidence of domestic demand growth moderating, and the implications of the recent deterioration in the international economy for monetary policy.*

Thank you, Chairman. I'm very pleased to be here, and to have this opportunity to respond directly to some of the serious concerns that have been expressed recently by Trade Union leaders—among others—about monetary policy.

Let me start with what is perhaps your biggest concern. You think that the Monetary Policy Committee, which I chair and which sets interest rates, is only interested in controlling inflation, and takes little or no account of the effects of its decisions on real economic activity and jobs. Some of you evidently think that's because we're a crowd of 'pointy-heads' or 'inflation nutters', or even 'manufacturing hooligans'—and I'm not sure these descriptions are intended as terms of endearment. More seriously, some of you think that the problem lies with our remit from the Government, which is first, to maintain price stability—defined as an underlying inflation rate of 2½%—and, subject to that, to support the economic policy of the Government, including its objectives for growth and employment.

Whatever the reason, your concern is that we place too much emphasis on holding prices down, and not enough on keeping growth and employment up. The implication is that you see a trade-off between inflation and the rate of economic growth, so that if only we'd let up a bit on controlling inflation, then this country could enjoy higher activity and lower unemployment, which are the really good things in life—or at least, we could avoid some of the worst damage that is currently being inflicted upon the whole of agriculture, large parts of manufacturing industry and even some service sectors.

And that might even be true for a time. The trouble is that, in anything other than the short term, it would be likely to mean more rather than less economic damage, and lower rather than higher growth and employment.

Often in the past in this country, we behaved as if we thought that promoting higher growth and employment—which of course is what we all want to see—was largely a matter of pumping up demand. We paid too little attention to the structural, supply-side, constraints. All too often, we tried to buy faster growth and higher employment, even at the expense of a bit more inflation. In effect, we tried to squeeze a quart out of a pint pot. And you all know the result—rising inflation and a worsening balance of payments, which eventually could only be brought back under control by pushing up interest rates dramatically, and forcing the economy into recession. I don't need to remind you of the really miserable social as well as economic consequences—as right across the economy, people lost their jobs, their businesses and their homes. More insidiously, repeated experience of 'boom and bust' produced a pervasive short-termism in business behaviour, which infected both industry and finance, and—dare I say—both employers and employees, however much we all like to blame everyone else. Everyone was tempted to grab what they could while the going was good.

But we have learned from that experience. We've learned that in anything other than the short term, there really is no trade-off between growth and inflation. What we are trying to do now through monetary policy is to keep overall demand in the economy growing continuously broadly in line with the capacity of the economy—as a whole—to meet that demand. Both the previous government and the present

(1) Delivered in Blackpool on 15 September.

one set a low inflation target as the immediate objective of monetary policy, not as an end in itself, but in effect as a measure of our success in keeping demand in line with supply. So the real aim is to achieve stability across the economy as a whole in this much wider sense.

Now, there is not a lot, frankly, that we can do directly through monetary policy to affect the supply side—the underlying rate of growth that can be sustained without causing inflation to rise. That can be influenced by the whole raft of Government policies, ranging from education and health to taxation and social security, and it depends ultimately on the ingenuity, the productivity, and the flexibility, of the economy. Employers and employees, working together, clearly have a crucial role to play in this context, and I recognise the constructive and forward-looking role that many of you are now playing to improve the supply-side capacity of the economy.

Monetary policy operates on the demand side. And the best help that we can give is to keep overall demand consistently in line with that supply-side capacity—not letting it run above capacity, but not letting it fall below capacity either—as reflected in consistently low inflation. That way, we can moderate rather than aggravate the unavoidable ups and downs of the business cycle, enabling steadier growth, high levels of employment and rising living standards to be sustained into the medium and longer term. And if we can do that, then we will contribute indirectly to the supply side, by creating an environment that encourages more rational, longer-term, decision-making throughout the economy.

I would hope, Chairman, that on this basis we could all agree at least on what it is we are trying to do. The debate is not about the ends, it is about the means. We are every bit as concerned with growth and employment as you are—as anyone in their right mind must be. But we are interested in growth and employment that is sustained into the medium and long term. And permanently low inflation is a necessary condition for achieving that.

But even if we agree on the objective, that still, of course, leaves plenty of room for us to disagree about what that means for the actual policy stance—the level of interest rates—at any particular time. In fact, as you may have noticed, because we are wholly open about it, even the individual members of the MPC have been known to disagree about that—at the margin.

Outside the MPC, a lot of people say to me, 'OK, I agree we don't want to return to boom and bust, but you are still overdoing it. From where I sit,' or 'From what I'm told,' they say, 'we're headed for recession—just hours away'. Sometimes they imply by that we are also going to undershoot the inflation target, sometimes they don't much seem to care about inflation.

Now there are always plenty of people who claim to know what's going to happen to the economy, to know that interest rates are 'clearly far too high' or 'clearly far too low', and the present time is no exception. It's been difficult recently to hear yourself think above the deafening noise of opinions on the state of the economy, which, understandably, often reflect the situation in that particular neck of the whole-economy wood.

The truth is that neither we, nor they, nor anyone else, can know with any great certainty precisely where demand is, in relation to capacity in the economy as a whole. Still less do we know where it is likely to be over the next couple of years—and that is the more relevant consideration, given the time it takes before changes in interest rates have their full effects. Monetary policy is not a precise science—we've never pretended that it is. But it can't be just a matter of sweeping, broad-brush, impressions based upon partial information either. What we have to do is to make the best professionally informed analysis we can, of all the sources of information available to us, relating to every sector of the economy and every part of the country, and then constantly review and, as necessary, modify our judgments, month by month and quarter by quarter, in the light of the flood of new information as it becomes available.

And that, of course, is exactly what we do in fact do—using the vast array of official economic statistics and financial market data, all the publicly available and some private surveys and commentaries, as well as a wealth of anecdotal and structured survey evidence that we collect ourselves, through our 16 Non-Executive Directors, through the frequent visits that MPC members make around the country, and through meetings in London, and through our network of twelve regional, information-gathering and disseminating, Agencies, with their 7,000 industrial contacts throughout the United Kingdom. And we openly display the facts as they are available to us, as well as our analysis and our conclusions, regularly, through the publication of the minutes of our monthly meeting and in the quarterly *Inflation Report*.

So when people say to me that the economy is headed for recession, I'm interested in comparing the evidence on which they base their views with our own evidence, and I want to know whether or not they are also saying that they expect us to undershoot the Government's inflation target.

Let's just for a moment turn down the noise and look at some of the relevant facts as they relate to the economy as a whole.

Since the economy started to recover from recession in the spring of 1992—some $6\frac{1}{2}$ years ago—overall output has grown at an average rate of about 3%. That is well above the trend rate for the past 20 years, of just over 2%. Employment has increased by 1.2 million during this period, while unemployment has fallen almost month by month, on the familiar claimant-count measure, from a peak of over 10% in 1993, to some 4.7% now. That is the lowest rate for 18 years. Meanwhile, retail price inflation (on the Government's target measure) has averaged around $2\frac{3}{4}$%—

that's the lowest for a generation. There's not much evidence here that low inflation inevitably means low growth and employment.

But of course, we started this period with demand below capacity—with a fair amount of slack in the economy, which we were gradually taking up. By last year, it had become clear, in the evidence of rising capacity utilisation and of growing tightness in the labour market, that unless we acted to moderate the growth of demand, we were at risk of overheating. That's why we tightened policy over last summer—to slow things down before inflation took off, and to head off a subsequent recession. And although, as I say, you can never be sure—economic forecasting is a very uncertain business—a necessary slowdown rather than a more serious recession is what we think we're seeing, and, as I understand it, that is what your own General Council thinks too.

Our problem in slowing the economy down has been enormously complicated by the increasing imbalance between the domestic and the internationally exposed sectors of the economy. Domestic demand for goods and, particularly, for services has been unsustainably strong, and large parts of the economy have been doing very well on the back of that. But the sectors that are most exposed to international competition have been suffering enormous pressure, as a result, initially, of the exaggerated strength of sterling—especially against the major European currencies in the run-up to decisions on the euro; and as a result subsequently of the successive waves of turmoil spreading through large parts of the global economy. Overall demand growth—at least until fairly recently—remained excessive, and the labour market has continued to tighten.

The question was what should we do? It was not that we didn't know that large parts of the economy were under the hammer—we have been as conscious of that as anyone. Still less was it that we didn't care—we care, just as you must, about activity and jobs in all sectors of the economy. But the stark choice confronting us was either to tighten policy, knowing that would inevitably increase the pain that the internationally exposed sectors were already suffering, or to disregard the developing excess overall demand in order to protect the internationally exposed sectors from further damage.

This second course might have meant less pain for the internationally exposed sectors in the short run. But it would have meant putting the whole of the economy, including the exposed sectors, at risk of accelerating inflation, and it would in all probability have meant a much sharper downturn in the economy as a whole a little further ahead. We've been round that buoy all too often before. And so we tightened policy, trying as best as we could through our tactics to minimise the unwanted upward pressure on the exchange rate.

I know only too well, Chairman, that this will be cold comfort to many of you in the exposed sectors—but there's no point in pretending that things are other than they are. The present imbalance means that we are trying to maintain stability in extraordinarily difficult circumstances.

But I will make one final point. The inflation target we have been set is symmetrical. A significant, sustained fall below 2½% is to be regarded just as seriously as a significant, sustained rise above it. And I give you my assurance that we still be just as rigorous in cutting interest rates if the overall evidence begins to point to our undershooting the target as we have been in raising them when the balance of risks was on the upside. There is now evidence that domestic demand growth is moderating, as it must do, and that the labour market is tightening more slowly than before. On top of that, as we said in our press notice last Thursday—announcing that we had not changed interest rates—we recognise 'that deterioration in the international economy could increase the risks of inflation falling below the target'. That is still not the most likely outcome in the eyes of most of us—and given the real world uncertainties, we can anyway never sensibly tie our hands. But there is no doubt in my mind that recent international developments have at least reduced the likelihood that we shall need to tighten policy further.

Economic policy, with and without forecasts

In this speech,[1] *Sir Alan Budd, a member of the Bank's Monetary Policy Committee, discusses the debate between those who believe that monetary policy should be based on a small number of current indicators and those who use model-based forecasts to assist their decisions. He argues that all policy-makers use forecasts, implicitly or explicitly, and all respond to current indicators. He describes the role of the inflation forecast in the MPC's decisions.*

My topic this evening is the use of forecasts in economic policy-making in general and their use by the Bank of England's Monetary Policy Committee (MPC) in particular.

Although this lecture is dedicated to Alec Cairncross, the first part of it is devoted to, or perhaps directed at, another economist whom I greatly admire and respect, namely Samuel Brittan. I am particularly sorry that he is not here this evening. It would clearly be grossly ill-mannered to conduct a dispute with him in his absence, so I hope that it will be recognised that I want to question some views about forecasting that are widely shared, and of which Samuel Brittan is certainly the most eloquent, and possibly the most influential, exponent.

I shall start with some quotations taken from recent columns and articles by Mr Brittan.

First, a few extracts from an *Economic Viewpoint* in May of this year:[2]

'But the signal for middle-of-the-road opinion to swing towards the hawks is unlikely to be the minutiae of the forecast path for ... output to which the [Bank of England's] *Inflation Report* devotes such loving care'.

He goes on to say that support for an interest rate increase would most probably come from an increase in interest rates by the US Federal Reserve. He says:

'This may not be entirely rational, but it is hardly less so than the supposedly scientific forecasting in which the more academic members of the MPC prefer to indulge'.

He concludes:

'Someone who is suspicious of forecasts is not committed to ignoring clear forward-looking information, of the kind we had when oil prices rose fourfold in 1973. But a rational sceptic prefers current data to prognostications about the implications of slight variations in demand and output two years ahead.'

In August,[3] he discussed the MPC's concern with the output gap, and records his preference for monitoring nominal demand. He said:

'As an immediate step I would give more weight to actual inflation as distinct from rarefied speculation about its trend in two years' time'.

Finally, two quotations from his article 'An Inflation Target is Not Enough'.[4] Again, this article is mainly about his view that monetary policy should be directed at nominal GDP (ie total spending in the economy), rather than at inflation alone. That is an important issue, but I do not intend to discuss it now. But his remarks are highly relevant to the more general issue that concerns me.

'There is no perfect solution; but it would help to go more by actual evidence of inflation and less by forecasts and models...'

He goes on:

'National cash objectives can indeed be pursued by means of formal forecasts and with a heavy fine-tuning emphasis. But they can also be pursued in a way which puts less reliance on forecasting abilities and reduces the need for an econometric straitjacket. Indeed a nominal demand objective has one advantage not sufficiently stressed by its adherents. That is, it can enable us to rely less on forecasting ability. For it would not be disastrous if the best we could do would be to react to the current situation'.

The view being expressed here is that it is better to conduct policy on the basis of observing a few actual variables than on forecasts derived from econometric models.

There are important substantive issues here, but first I want to clear up a matter of semantics. I would assert that all actions undertaken with the intention of affecting future outcomes involve forecasting. The only questions are:

(1) Given at the Sir Alec Cairncross Lecture for the Institute of Contemporary British History and the St Peter's College Foundation, 27 October.
(2) Brittan, S, Economic Viewpoint, *Financial Times*, 14 May 1998.
(3) Brittan, S, Economic Viewpoint, *Financial Times*, 6 August 1998.
(4) Brittan, S, 'An Inflation Target is Not Enough', Essays, Moral, Political and Economic, *Hume Papers on Public Policy*, Volume 6, No 4, 1998.

- are the forecasts implicit or explicit?
- which variables are taken into account in producing the forecasts?
- how are the forecasts derived from the variables?

I would add that all forecasts depend on observations of actual variables (either current or past). We all react to the *current* situation, the only question is how we do so.

The context in which I shall be discussing economic forecasts is the control of inflation (although similar arguments would apply if I were discussing the control of unemployment or the balance of payments). I hope it is common ground that inflation responds to economic developments with a lag. (Though there are some changes, eg changes in indirect taxes, that can affect the price level immediately.) Thus, policy actions taken today will affect inflation over a period of up to two years or more. It follows that anyone taking policy actions to control inflation must, at least implicitly, be thinking about the effects on inflation in the future, ie they are forecasting.

I should mention at this point that when I circulated an earlier version of this paper to my colleagues at the Bank of England, Mervyn King kindly drew my attention to comments by Federal Reserve Chairman Alan Greenspan made at the Bank of England's Tercentenary Symposium on The Future of Central Banking.(1) As a mere Treasury official I was not, of course, invited to that Symposium, nor had I read Alan Greenspan's comments; but I found that he had summarised, in a few sentences, most of the ideas that I shall be presenting this evening. I have often owned up to the charge of subconscious plagiarism, but I think this is the first time that I have committed an act of psychic plagiarism.

Alan Greenspan was commenting on a paper by another of my colleagues, Charles Goodhart. Greenspan's words were:

'Implicit in any monetary policy action or inaction is an expectation of how the future will unfold, that is, a forecast'.

He was particularly referring to those who favoured simple rules of policy-making. He went on:

'The belief that some formal set of rules for policy implementation can effectively eliminate that problem is, in my judgment, an illusion. There is no way to avoid making a forecast, explicitly or implicitly'.

In relation to monetary rules, he commented:

'I am not saying that monetary aggregates are without value, or that intermediate targets should not be sought. I am saying that their use requires a forecast just as much as the broader, so-called discretionary policy procedures'.

It could be said that I have defined forecasting very widely—to include any form of thinking about the future—whereas we all know an economic forecast when we see one, and plenty of policy-makers do perfectly well without them. My reply is that we do indeed use the expression 'economic forecast' to describe a table of numbers (or a set of charts) showing the future values of economic variables. But it can be misleading to think that those who base their policy actions on such tables and charts are behaving in a fundamentally different way from those who do not. All policy actions in relation to inflation, for example, must depend on a response to observations of events and on some idea (however vague and uncertain) of how today's policy will affect the future path of inflation.

Some of you may by now be thinking that all this talk about forecasting is beside the point. Surely what I am really talking about is policy reaction functions. The question at issue is, how does the policy-maker respond to new information? So we could transfer our discussion into one about the nature of the reaction function. How many variables are involved? What use is made of formal transformations of these variables etc? And one is tempted to say, 'If it's the forecast that upsets you, we can leave it out'. A reaction function is a mapping from a set of observations to a policy decision. If the decision-making process of the MPC was entirely automatic, we could ask the computer to print out just one number, the interest rate required to achieve the Government's inflation target. The forecast would strictly be an incidental by-product of the policy-making process. Instead of saying that the decision is based on a forecast of inflation two years ahead (or whatever), we could say (correctly) that the decision is based on our current reaction to observations. That would also have the benefit of demonstrating that the distinction between those (sturdy realists) who base their policy actions on current observations and those (airy-fairy academics) who base them on forecasts is not very helpful. We all use current (and past) observations, since that is all we have.

Having said all that, I am going to have to explain why the MPC does use explicit economic forecasts, and I shall do so in due course. But having, I hope, resolved a question of semantics, let me move on to the substantive issue, which concerns the nature of the reaction functions. I have found it difficult to find suitable labels to describe the two approaches (and at any rate it is really a continuum), but I suggest 'hedgehogs' and 'foxes', from Tolstoy's remark that the fox knows many things but the hedgehog knows one big thing. So my hedgehogs rely on a few variables and my foxes rely on rather more variables and will possibly use formal methods to transform some or all of them into a forecast or an actual decision. (I think, incidentally, that this

(1) Greenspan, A, Discussion of Goodhart, C, Capie, F and Schnadt, N, 'The development of central banking', in Capie, F, Goodhart, C, Fischer, S and Schnadt, N (ed) *The Future of Central Banking*, Cambridge University Press, 1994.

is not yet another contribution to the 'rules versus discretion' debate, since either side may or may not believe in rules.)

On the face of it, it seems strange that anyone should suggest that it is better to base decisions on a small number rather than a large number of observations of current and past economic variables. How can more mean worse? Analogies are always unfair, but I am going to use one all the same. Suppose that one was being driven from A to B, where B is a well-defined but unfamiliar destination. How would one react if the driver announced at the outset that he favoured a simple approach to route-finding—he only read road signs that were on the right-hand side of the road, or that were wholly in upper-case letters, or that began with consonants? You might believe that you would reach your destination eventually, but you would fear that it was not the best way to proceed. Suppose, on the other hand, that the driver produced a map. A map is, of course, a gross over-simplification of the real world, and no two maps of any given area seem to be the same—there are different scales, different colours, different details and so on. But despite all this, you might be reassured by this abstract device. And you might be even more encouraged if the driver told you he intended to combine the use of the map with attention to road signs etc. Now let us take the analogy further. Suppose you set off and the driver leapt out every few hundred yards and measured the temperature of the road surface; or suppose he told you that at each road sign he converted the letters to their numerical equivalent and used a complicated formula to derive the desired direction, you might reasonably believe that these procedures would reduce the chance of your reaching the destination.

Is it this fear that leads people to condemn the use of formal models and a wide range of information in policy-making? If this is so, it would be a sad commentary on the large amount of time and money that has been spent on developing econometric models and on improving economic statistics over the past 30 years or so. In preparing this lecture, I re-read the 1966 Report from the Estimates Committee on The Government Statistical Services.(1) (As is so often the case, I found I had mis-remembered it after the gap of 25 years since I last looked at it.) The Committee recommended that 'urgent steps be taken to increase research on forecasting methods and on the data used in forecasting both by Government and by outside bodies with Government Support and co-operation'.

In its written evidence to the Committee, the Treasury discussed the use of statistics in the analysis and forecasting of the domestic economy. It said:

'The quality of the analysis has been very much improved by a large-scale and very rapid improvement, amounting to a transformation, in the range and reliability of statistics, and the speed with which they are produced'.

It went on:

'The counterpart of the improved flow of statistics, and the now quite long historical runs, has been an improvement in interpretation. To some extent, the improvement consists of a more sophisticated assessment of what such and such a figure means. In addition, a number of research studies have been carried out into the nature of the key relationships; some of these have been published in the *National Institute Economic Review*. More generally, as time goes on and as statistics improve, the whole process of analysis and forecasting gets continually more refined, explicit and skilful'.

Alec Cairncross gave evidence to the Sub-Committee on Economic Affairs (which was conducting the study) on 25 January 1966, and was willing to share some of this optimism. He was asked by the chairman (Dr Jeremy Bray) whether he agreed that the measure of quality in forecasting was the quality of ultimate control that it makes possible, rather than the accuracy of plus or minus 2% in the outturn. He replied:

'I think this is so. I think it is the degree to which you can operate on the economy in the light of the forecasts, and here I think we have made a very definite improvement'.

He referred in particular to the development of techniques for measuring the impact on the economy of changes in government policy. However, as one might expect, this optimism was accompanied by a considerable degree of caution. Alec was asked about research on forecasting outside the Treasury. He replied:

'We have tried to interest universities in this, not always very successfully because I think it does require a very thorough knowledge of the statistical material. A good many would like to do it the short way by taking the figures and working on the figures, but most of the time you have to devote to studying whether the figures mean what they seem to mean before you can do any useful research at all, and this is why on occasion we have found attempts to interest the universities rather unsuccessful or unfruitful'.

Let us file away those wise words for future reference, and return to the hedgehogs and foxes. Let us imagine an extreme hedgehog position. The task is to control inflation; the only variable that contains any information about the future rate of inflation is the current rate of inflation. Therefore, policy-makers should tighten policy when inflation moves above its target rate and relax it when it falls below. (An alternative extreme hedgehog position is to state that only the growth of the money supply contains any information about the future rate of inflation.) The foxes believe that there is a wide range of variables (which they call 'information variables') that provide information about the future rate of inflation. Who is right? I personally am convinced by all the studies that show that if we are

(1) Estimates Committee, Fourth Report, Government Statistical Services, HC 246, 1966.

concerned with forecasting, foxes do better than hedgehogs. So why do the hedgehogs disagree? I think that there are a number of reasons why the debate continues. They are related to policy-making rather than to forecasting itself. I shall list them briefly with some comments, and I shall return to some of the points when I discuss the operation of the MPC.

One reason is that the hedgehogs accuse the foxes of cheating. They will always find another figure (for a hitherto ignored economic variable) that allows policy-makers to postpone making an unpopular decision. That is really an aspect of the rules versus discretion debate. We can all agree that bad discretion is worse than good rules.

Another charge is that the foxes rely excessively on models, without fully understanding the data on which they are based. (That was the fear expressed by Alec Cairncross.) There is the related charge that the foxes have an exalted view of their ability to control inflation, and therefore indulge in excessive fine-tuning. There are really two different versions of this charge. The first, which was propounded by Milton Friedman, states that policy-makers do not have superior information about future cyclical movements in the economy. Their attempts at stabilisation (either for its own sake or as a means of controlling inflation) will therefore make matters worse. There is a more recent version, which will be discussed by my colleague Charles Goodhart in the Keynes Lecture in two days' time. He examines the argument that if our knowledge of the economy is subject to a particular kind of uncertainty—known as Brainard uncertainty—large changes in policy in response to changes in the expected rate of inflation could cause an undesirable increase in the volatility of inflation. Charles discusses the issue in relation to the observed frequency of policy changes, particularly policy reversals. I shall not anticipate his conclusions.

Since these types of argument are based on policy-making rather than on forecasting on its own, there is no satisfactory way of resolving them. We would have to run through history twice, once with the hedgehogs in charge and once with the foxes in charge, and compare the outcomes. As a possible substitute, we can conduct synthetic experiments; but that requires us to use models, and we may not be able to agree about them.

Let me move on to the use of economic forecasts by the MPC. I should emphasise that the following account represents my own views, which may or may not be shared by my colleagues. We are all individually responsible for our own decisions, and are free to use the forecasts to inform our decisions in the way we think best.

I mentioned earlier that the production of an explicit forecast is not a necessary part of policy-making if we rely on a formal reaction function. We can go straight from the observations of the relevant variables to the policy actions. Why then does the MPC produce and publish a forecast of inflation (which has now been joined by a forecast of output)? I think there is an internal reason and an external one. The internal one is concerned with the quality of the decision we take; the external one is concerned with explaining that decision to the public.

The immediate point is that we do not rely wholly on formal methods to reach decisions. The production of the forecast allows us to bring formal and informal methods together. As my colleague John Vickers pointed out in a recent lecture in Frankfurt,(1) the econometric model that is used in the Bank to help produce the forecasts uses about 150 economic variables; but each month, the MPC is presented with information on a thousand or so variables. If we believe that the variables that are not included in the model are relevant to our decisions, we obviously want to take them into account. There are considerable advantages to using the forecast as a framework for doing this. For one thing, it gives us a language with which we are familiar. We are used to watching an economy unfold and thinking about how it will develop in the future. We also have some ideas about the normal ranges within which an economy will behave (although of course we can all be greatly surprised from time to time). Thus if we think there is important new information in a non-model variable, we can examine the plausibility of the effect that it might have on the future path of inflation, and hence its possible implications for our decision. Finally, the model allows us to take account of the complex interactions within the economy, so that we can assess how changes in one part of the economy will change the overall picture. But we remain able to modify those effects if we believe we should do so.

I have referred to *the* econometric model. In fact, the Bank uses a suite of models, and we use our intuition and theoretical understanding to decide which particular model is appropriate to thinking about current circumstances. We can also develop *ad hoc* models to explore the implications of particular developments. For example, understanding the implications of a possible credit crunch might require a special model. The suite of models enables us to put together components from different models to construct an appropriate forecasting model each quarter. (One could use the analogy of hedgehogs and foxes to distinguish between those who rely on one big model and those who rely on many small models. The Bank is very much a fox on this definition.)

The process of policy-making that I am describing represents a particular way of using a reaction function. Instead of going straight from the observations to the decision, we stop the process in the middle. We go from one set of observations to a formally produced forecast, and we then adjust that forecast in the light of all other information that we believe is relevant. (In practice, even the more formal part of the process involves a considerable

(1) 'Inflation targeting in practice: the UK experience', given at the Conference on Implementation of Price Stability, 11–12 September 1998. See pages 368–75.

amount of judgment.) This is very fox-like behaviour. It is obviously not the only way of reaching policy decisions. Many authorities do not produce any type of explicit forecast. Others may publish or use a 'staff forecast'. Such a forecast will have been produced, using a combination of formal and informal methods, by the staff of the central bank (or finance ministry). It may inform the decision, but the policy-makers are not responsible for, or committed to, the forecast itself.

That is not, in my view, the current position. The forecast represents the collective view of the MPC members. It is not necessarily anyone's individual forecast, nor is it the average of the individual forecasts. If the MPC was told to go away until it had produced a single forecast, this is the forecast it would produce after discussion and a willingness to accept some compromise.

Does the forecast imply a decision? The practical answer is clearly not. At the time of the February inflation forecast, the Committee was divided four-four on whether interest rates should be raised. At the time of the August inflation forecast, seven members voted for no change, one voted for a cut and one voted for an increase. So it is clearly possible to produce a collective forecast and yet disagree about the interest rate decision. Why does this happen? It is for individual members to explain their actions, but I would make one general point. I have said that we stop the process of decision-making—the process of applying our reaction function—in the middle, in order to incorporate a wider range of information about the economy. But a reaction function consists of two things, a model of the economy and a welfare (or loss) function.

The Government has given the MPC a loss function that, reasonably enough, is not precisely specified. The objective is clearly defined: the target 'at all times' is a twelve-month inflation rate of retail prices excluding mortgage interest payments of 2½%. But the Chancellor's letter setting out the remit also says:

'The framework takes into account that any economy at some point can suffer from external events or temporary difficulties, often beyond its control. The framework is based on the recognition that the actual inflation rate will on occasions depart from its target as a result of shocks and disturbances. Attempts to keep inflation at the inflation target in these circumstances may cause undesirable volatility in output'.

There is room for disagreement about what constitutes 'undesirable volatility'. Also, as John Vickers pointed out in his Frankfurt lecture, there is room for disagreement about whether policy should be directed at the mean, the mode or the median of the probability distribution of future inflation rates. (That depends on the nature of the loss function for deviations of inflation from its target.) Finally, there is the issue, to which I have already referred, that is the subject of Charles Goodhart's forthcoming Keynes Lecture. The possible costs of policy reversals were specifically discussed in the minutes of the February meeting as one of the reasons why interest rates were not raised, even though the associated commentary said that it was more likely than not that interest rates would have to be raised to meet the inflation target.

So even if there is agreement about the forecast, there is no simple mapping from the forecast to the policy decision.

This all smacks of fox-like behaviour. How do we meet the criticisms made by the hedgehogs? I said that the publication of the forecast serves the external purpose of explaining our decisions to the public. The *Inflation Report* is designed to fulfil the requirement imposed on the MPC by the Bank of England Act to publish a quarterly report containing:

(i) a review of the monetary policy decisions taken by the MPC in the previous three months;

(ii) an assessment of the developments in inflation in the United Kingdom over the same period; and

(iii) an indication of the expected approach to meeting its inflation objective.

The Act does not require the MPC to publish a forecast of inflation, but we believe that it is right to continue the practice started by the Bank when the *Inflation Report* provided its independent assessment of the government's actions. (The system set up by Norman Lamont after the United Kingdom left the ERM in 1992.)

The forecasts for inflation and GDP provide not only a central projection but also the MPC's assessment of the probability distribution around the central projection. The public is free to comment on and criticise the projections. It can assess the views that informed the MPC's decisions. I believe that the process of publication reduces the chance that we shall succumb to the failings of which the hedgehogs accuse us.

Shall we cheat? Time will tell. But the fact that we provide a detailed account of the material we consider, and a full account of the MPC's deliberations, should reduce the risk. More importantly, the MPC's remit of controlling inflation should remove the risk that we are tempted to exploit the short-run trade-off between growth and inflation.

Are we so obsessed with our model-building skills that we fail to analyse what the numbers mean? In reply to that, I would repeat that the forecasts are only partly model-based. We are entirely free to adjust them in the light of additional information, and we do so. We also devote considerable time to trying to understand what the data mean. And I think that hedgehogs may be equally open to the charge that they do not fully understand the data they use.

Do we have an inflated view of our ability to control inflation? The *Inflation Report*, uniquely, shows the probability distribution of the inflation forecast (a system

pioneered by my colleague Mervyn King). The August *Report* suggests that the 50% confidence band for inflation in the third quarter of 2000 is about 1.9% to 3.3%. That is, there is a 50–50 chance that inflation will lie outside that range. I do not know whether that is excessively modest or excessively boastful, but we are certainly not claiming that we know precisely what inflation will be in two years' time.

Are we tempted into excessive fine-tuning? You must listen to Charles Goodhart, but I recall that the usual comment on the past conduct of monetary policy is that it has veered between 'too little, too late' and 'too much, too late'.

I have tried this evening to make the following points:

- no one can make policy decisions relating to the control of inflation without making a forecast, implicitly or explicitly;

- the distinction between relying on forecasts and on current observations to make policy decisions is invalid; a forecast is simply a particular transformation of current (and past) observations;

- there is a substantive issue concerning the number of economic variables that should be used to inform policy decisions. Policy-making supported by formal model-based forecasts typically use more 'information variables' than policy-making based on simple rules; and

- there are a number of risks associated with the use of large formal models in policy-making.

The Monetary Policy Committee uses a suite of models, and relies on a very wide range of supplementary information to guide its decisions. The production of an inflation forecast is not, technically, a necessary part of the decision-taking process, but it provides a valuable framework for discussion and the publication of the forecast also enhances transparency—its approach should minimise the risk that it places more weight on formal models than they can bear.

These are early days, and I am sure that the MPC will learn from experience and adapt its techniques accordingly; but I hope I have demonstrated that we are seeking to combine the best qualities of hedgehogs and foxes.

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Financial Statistics Users Group seminar

In March 1997, the Bank of England and the ONS hosted a Financial Statistics User Group (FSUG) conference, which was introduced by Mervyn King, Deputy Governor (then Executive Director) of the Bank of England. A full report of this seminar was published in July 1997; if you wish to receive a copy or would like to be on the mailing list of FSUG, please contact the Group secretary, Daxa Khilosia, Monetary and Financial Statistics Division HO-5, telephone 0171–601 5353.

Targeting Inflation book

In March 1995, the Bank hosted a conference of central banks currently adhering to inflation targets. This book, edited by Andrew Haldane, draws together contributions from each of the eight countries represented at the conference. It details cross-country experiences of this monetary framework and the key operational and theoretical issues it raises. The book is suitable for both academics and practitioners. The price of the book is £20.00 plus postage and packaging.

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In September 1995, the Bank held a conference to discuss a broad range of theoretical and practical questions raised by index-linked debt in general, and the UK experience in particular. This book contains revised versions of the papers presented at the conference, as well as the papers that were circulated by the Bank ahead of the conference, setting out background information and key policy issues. The price of the book is £10.00 plus postage and packaging.

Openness and Growth book

The Openness and Growth book, published in October 1998, contains the proceedings of an academic conference held at the Bank of England in September 1997. The research described in the book investigates the link between productivity growth and the international openness of the UK economy. The price of the book is £10.00 plus postage and packaging.

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