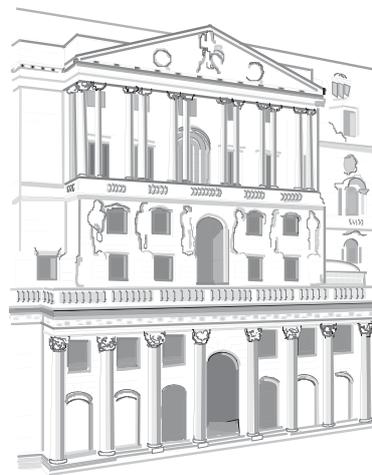


Bank of England Quarterly Bulletin



February 1997

Volume 37 Number 1

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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 government's inflation target—a twelve-month rate of 2½% or less, measured by RPIX. Section 1 considers retail prices, Section 2 investigates money, credit, and financial market data, including the exchange rate, and Sections 3, 4 and 5 examine demand and output, the labour market and firms' pricing behaviour respectively. Section 6 presents the Bank's medium-term inflation projection, the risks surrounding it, and information about non-Bank inflation forecasts.

The operation of monetary policy (pages 5–20)

Official interest rates were increased once in the period from October to December, by 25 basis points to 6% on 30 October. Sterling's strong and broadly based appreciation was the most marked development in the foreign exchange market. The gilt yield curve flattened, and this was reflected in a flattening of the implied forward inflation expectations curve: longer-term inflation expectations fell sharply. Gilt sales of £6.8 billion were made in this period. The Bank announced plans for changes in its daily operations in the sterling money markets.

The international environment (pages 21–31)

The buoyant US economy slowed in the third quarter but picked up again in the fourth quarter. The slowdown in Europe may have troughed in mid-1996. GDP growth in Germany, France and Italy was quite strong in the third quarter, largely led by exports. But it was boosted by temporary, special factors and domestic demand remained weak. The slow recovery in Japan continued in the third quarter. Inflation remained low, reflecting the large output gaps in several continental European countries and in Japan. Inflation in the United States has been surprisingly low. Several European countries cut official interest rates in November and December. But in the G3 countries, interest rates were left unchanged in the fourth quarter. All major industrial countries plan to tighten fiscal policy in 1997.

Financial market developments (pages 32–42)

Equity and bond issuance levels were high in most major markets in 1996. Equity prices rose strongly in the United States and Europe over the year. Speculation over the timing of, and participants in, the planned European Monetary Union continued to be an important influence on bond, equity and derivatives markets.

Research and analysis (pages 43–56)

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

Recent yield curve behaviour—an analysis (By Bill Allen, Deputy Director, Monetary Analysis). This article analyses recent fluctuations in ten-year interest rates in six countries using an estimation technique to decompose them into different maturity segments, and draws conclusions about the effects on ten-year yields of the changing state of the business cycle and of changing longer-term inflationary expectations.

Increasingly weightless economies (By Danny T Quah, Centre for Economic Performance, the London School of Economics). This article is one of an occasional series provided by academics working outside the Bank of England. The views expressed reflect those of the author rather than those of the Bank of England. Danny T Quah examines how, when an economy grows, its patterns of production and consumption systematically change. He describes one such large-scale evolution, namely, the increasing weightlessness of aggregate output across advanced economies. In all fast-growing successful countries, growth in information technology has contributed positively both to increasing weightlessness and to economic growth. In the sample of countries studied here, the richer the country the higher the contribution to growth of information technology and services; in no country has manufacturing, as traditionally construed, continued to be as important.

Reports

(pages 57–78)

Monetary policy implementation in EMU—a Bank of England perspective on the EMI's proposals (By David Rule of the Bank's Gilt-Edged and Money Markets Division). This article summarises and explains the European Monetary Institute's (EMI) proposed operational framework for the European System of Central Banks (ESCB) to conduct a single monetary policy in Stage 3 of Economic and Monetary Union (EMU). The framework would apply in the United Kingdom from 1 January 1999 if the United Kingdom fulfilled the necessary conditions to adopt the euro and the UK Government and Parliament decided to move to Stage 3. The article sets out the areas where agreement has been reached between EU central banks and gives the Bank of England's views on the issues that remain to be settled by the European Central Bank (ECB) after it becomes operational.

The gilt-edged market: developments in 1996 The gilt-edged market development programme continued in 1996, and gilt repo trading concluded a successful first year. Ten-year gilt yields were little changed at year-end from the previous year, but the yield curve was flatter. Gilt sales raised nearly £40 billion in 1996, taking the value of gilt-edged stock outstanding to £285 billion. Further reforms to the issuance process contributed to strong auction results and rapid sales of tap stocks in 1996. The year concluded with the Bank's proposals to extend its daily money-market operations to operate in gilt repo and to abolish the requirement that the gilt-edged market-makers be separately capitalised entities.

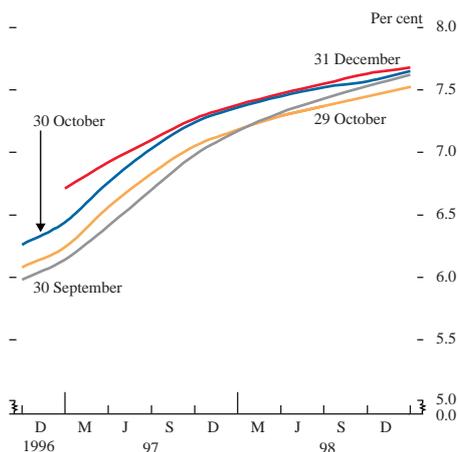
New arrangements for issuing banknotes (By John Bartlett, Head of Banking Services Division). In March 1996, the Bank announced a major restructuring of its regional activity, which will result in the closure of four of its five regional branches. Simultaneously, the Bank announced an expansion of its industrial and economic liaison role in the regions: agencies will continue to operate from each city where branches are closing, as well as from three new locations. The Bank's branches have hitherto played an important role in issuing, sorting and receiving notes, and this article describes some consequential changes to these arrangements.

The financing of technology-based small firms (By Adrian Piper and Melanie Lund of the Bank's Business Finance Division). This article summarises the report published by the Bank of England on 28 October 1996, highlighting the main findings and outlining the Bank's recommendations.

The operation of monetary policy

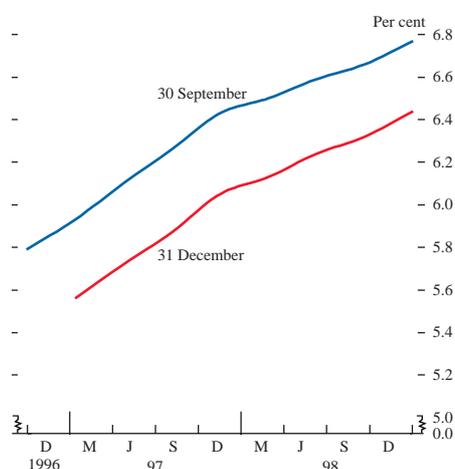
- *Official interest rates were increased once in the period from October to December, by 25 basis points to 6% on 30 October.*
- *Sterling's strong and broadly based appreciation was the most marked development in the foreign exchange market.*
- *The gilt yield curve flattened, and this was reflected in a flattening of the implied forward inflation expectations curve: longer-term inflation expectations fell sharply.*
- *Gilt sales of £6.8 billion were made in this period.*
- *The Bank announced plans for changes in its daily operations in the sterling money markets.*

Chart 1
Short sterling futures rate curves^(a)



(a) Three-month Libor rates implied by short sterling futures contracts.

Chart 2
Eurodollar futures^(a)



(a) 90-day eurodollar rates implied by futures contracts.

Introduction

In the United Kingdom, official interest rates were raised by 25 basis points to 6% on 30 October, the first tightening of monetary policy since February 1995. Market expectations of the future path of short-term interest rates were revised up immediately after the rise in official rates, and had risen further by the end of the year, influenced by higher-than-expected rises in the retail price indices and by accumulating evidence of the robustness of activity. Sterling rose strongly; by 10.5% in effective terms to finish at 96.1 on the effective exchange rate index (ERI) on 31 December. Over the period as a whole, the gilt yield curve flattened: short-term yields rose while those at longer maturities fell. The yield on ten-year gilts declined by 12 basis points to 7.48%.

In the United States data releases suggested that, after a slowdown in the third quarter, economic growth accelerated in this period, but without causing a deterioration in the immediate outlook for inflation. US official interest rates were unchanged. Financial markets revised down their expectations of the future path of US short-term interest rates, and bond yields fell over the period as a whole.

Data and survey releases suggested that the major European economies, while recovering, were growing below trend, and were behind the United States and the United Kingdom in the economic cycle. While there was no change in German official interest rates, within the European Union official rates were reduced in France, Italy, Spain, Portugal, Greece, Sweden and Finland. As the perception gathered pace that German economic growth might fall short of earlier expectations, financial markets revised down their expectations of future German money-market rates, and bond yields fell. The prospects for the timing of implementation of, and the range of participants in, Economic and Monetary Union (EMU) continued to be a major influence in European markets. European government bond yields fell over the period as a whole, with particularly marked falls in Italian, Spanish and Swedish

Table A
Interest rates, gilt yields and exchange rates; selected dates^(a)

1996	Interest rates (per cent per annum)				Short sterling future (d)	Gilt yields (b) (per cent per annum)			Exchange rates			
	Sterling interbank rates (c)					Conventionals	Index-linked		ERI	\$/£	DM/£	
	1 month	3 months	6 months	12 months			Short	Medium				Long
30 September	5.55/64	5.7/8	5.61/64	6.13/64	6.14	7.09	7.60	7.99	3.64	87.0	1.5640	2.3854
29 October	5.57/64	5.63/64	6.1/8	6.25/64	6.24	7.07	7.51	7.87	3.59	89.1	1.6108	2.4315
30 October	6.1/16	6.3/16	6.21/64	6.39/64	6.44	7.21	7.55	7.86	3.62	90.2	1.6326	2.4607
31 December	6.5/32	6.29/64	6.21/32	6.15/16	6.71	7.27	7.48	7.62	3.58	96.1	1.7120	2.6373

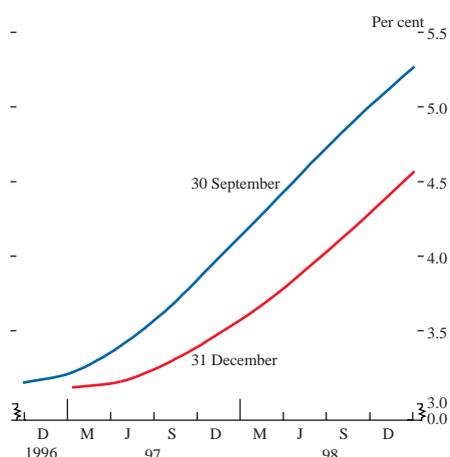
(a) Close-of-business rates in London.

(b) Gross redemption yield. Representative stocks: short: 7% Treasury 2001; medium: 7½% Treasury 2006; long: 8% Treasury 2015; index-linked—2½% Index-Linked Treasury 2016 (real yield assuming 5% inflation).

(c) Middle-market rates.

(d) Implied future rate: March 1997 contract.

Chart 3
Euromark futures^(a)



(a) 90-day euromark rates implied by futures contracts.

Chart 4
Effective exchange rates

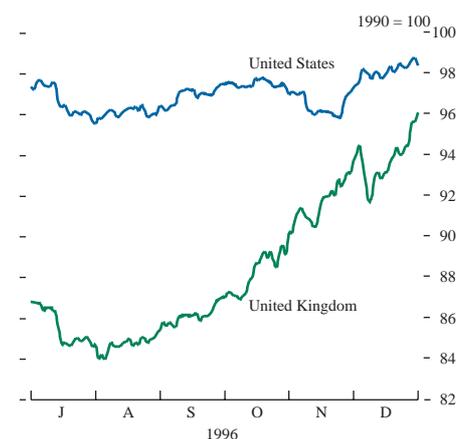


Table B
Sterling exchange rates

	1992 15 Sept.	1995 29 Nov.	1996 30 Sept.	31 Dec.	Percentage change since 30 Sept.
£/\$	1.8875	1.5340	1.5640	1.7120	9.5
£/DM	2.7812	2.2044	2.3854	2.6373	10.6
ERI	99.5	82.2	87.0	96.1	10.5

government bond yields. In part this process of convergence towards German and other 'core' European government bond yields may have reflected financial markets' belief that those countries had become more likely initial participants in EMU. It may also have reflected a perception that economic fundamentals in those countries had improved. The Finnish markka joined the exchange rate mechanism (ERM) and the Italian lira resumed its full participation in the mechanism. The gathering perception that EMU could start on time and with a wider group of participants than had earlier been thought may be a further explanation of the Deutsche Mark's relative weakness against the Ecu and the dollar (see Chart 9).

Foreign exchange markets

The appreciation of sterling was the most significant foreign exchange market development during the fourth quarter. It rose by 10½% in effective terms over the period and it finished 1996 at 96.1 on the ERI. The appreciation was broadly based, with sterling rising against all currencies in the ERI.⁽¹⁾ Sterling reached its highest levels against the US dollar and Deutsche Mark since September 1992 on 31 December at \$1.7120 and DM 2.6400 respectively. It had risen by 17% from its all-time low at 82.2 on the ERI, which was reached in November 1995 (see Table B).

It is difficult to account fully for the extent of sterling's appreciation, which began in early August after a sharp fall in both sterling and the US dollar in the second half of July, and which continued steadily in this period. Part of the explanation may be the emerging evidence of the strength of activity in the United Kingdom and the United States, particularly compared to much of continental Europe and Japan, which supported both sterling and the dollar. Actual and expected interest rate differentials moved in sterling's favour, against the US dollar and the main continental European economies. Interest rates implied by three-month eurodollar futures continued a decline which had begun following the Federal Open Markets Committee's (FOMC) decision to leave US official interest rates unchanged at its 24 September meeting. Over the period as a whole the term structure of interest rates implied by eurodollar contracts moved lower by 30–35 basis points as markets revised down their expectations of the path of US monetary policy. The forward rates implied by three-month

(1) See 'Revisions to the calculation of effective exchange rates', February 1995 *Quarterly Bulletin*, pages 43–8, for a discussion of the basket's composition.

Chart 5
Effective exchange rate indices: United Kingdom, United States, Germany and Japan

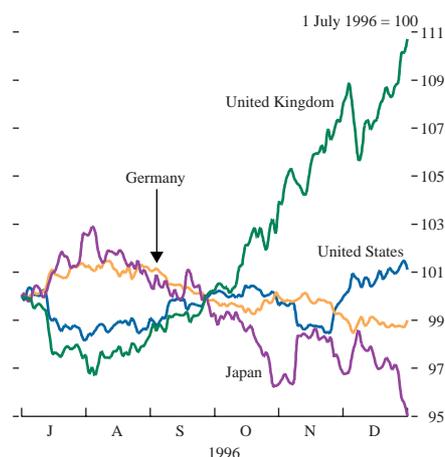
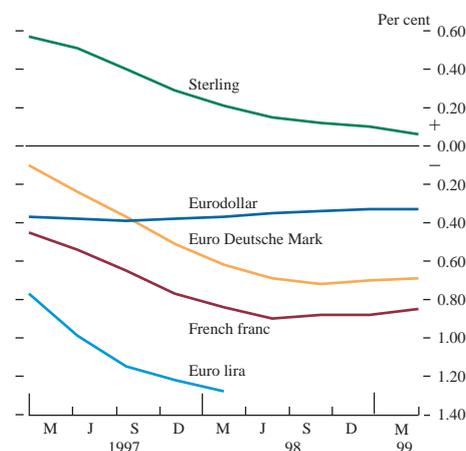


Chart 6
Changes to three-month interest rates implied by futures contracts^(a)



(a) 30 September to 31 December.

euromark futures contracts also fell, and the implied term structure flattened: the rate implied by the March 1997 contract declined by 10 basis points, while implied rates from late-1997 onwards were 50–70 basis points lower.

In contrast, actual and expected interest rates rose in the United Kingdom in this period. Implied rates on short sterling futures had begun to rise on contracts out to March 1998 before the increase in UK official interest rates on 30 October. But this official increase came earlier than expected and resulted in a broadly parallel upward shift of the implied term structure of around 20 basis points. The short sterling curve subsequently flattened over the rest of the period, with a further rise of around 25 basis points in the rate implied by the March 1997 contract, but with contracts beyond the end of 1997 little changed. Particular movements in sterling appear to have followed UK inflation and activity data releases, which were in general stronger than the market had expected. During October, for example, sterling rose strongly in particular on publication of the September RPI and third quarter GDP data on 10 and 25 October respectively. Market forecasts of an improving UK net trade position—with the current account deficit projected by the market for 1996 and 1997 being revised down, despite relatively strong economic growth—was another supportive factor for sterling.

The evolution of exchange rates also appeared to have been influenced to some extent by the rise in the oil price which occurred during the fourth quarter. The United Kingdom remains a significant net oil exporter. The June 1997 crude oil futures price rose by 12% in dollar terms in this period; when the futures price peaked at \$23.27 on 31 December, the yen had weakened to a 45-month low against the US dollar (Japan being a large oil importer, and the United States an oil producer), and sterling had strengthened to a post-ERM high against the US dollar.

The European background may have also served to support sterling, as financial markets appear to have increased the probability attached to EMU starting on time, and without UK participation, at least in the first wave. Fund managers appear to have increased their exposure both to the currency and to the sterling bond market from a neutral to an overweight position: market anecdote cited as an explanation for this a desire to diversify asset holdings away from the EMU core, or, to a lesser extent, concerns about a potentially ‘soft’ euro if EMU were to go ahead with a wide group of participating countries. In this respect, yield considerations gave sterling a distinct advantage over the Swiss franc, which has been a beneficiary of such inflows in the past.

Sterling rose sharply around the time of the rise in UK official interest rates. It opened at 89.1 on the ERI on 30 October, and ahead of the announcement it strengthened to 89.8. In the event it rose further during the day closing at 90.2, an increase of 1¼% on the previous day’s close. Following the rate rise, sterling continued to appreciate, rising from 90.2 to 91.4 on the ERI, until the publication of the Bank’s *Inflation Report* on 6 November. The currency briefly reacted to wire service comments that the *Inflation Report* suggested that the exchange rate appreciation might prove to be only transitory. Sterling’s upward momentum was checked, and by 13 November it had fallen back from 91.4 to 90.6 on the ERI. But sterling subsequently recovered following the publication of

Chart 7
Sterling/dollar implied volatility on currency options

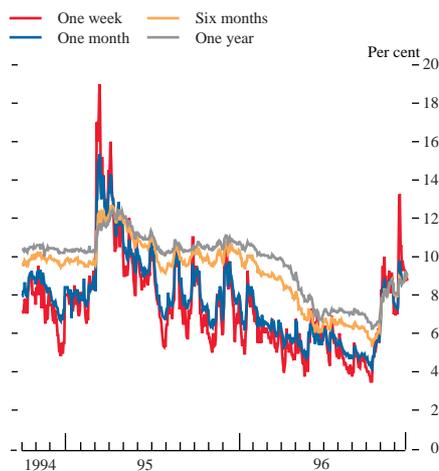


Chart 8
Sterling exchange rates

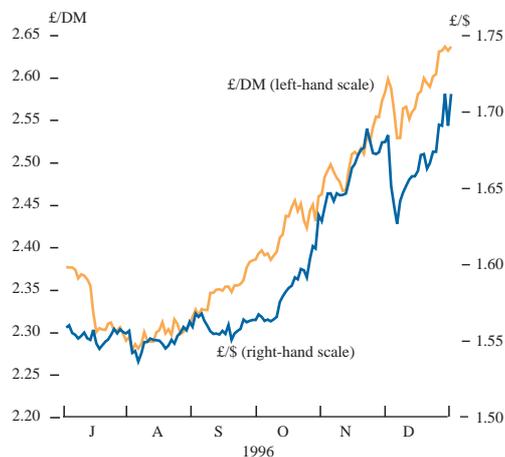
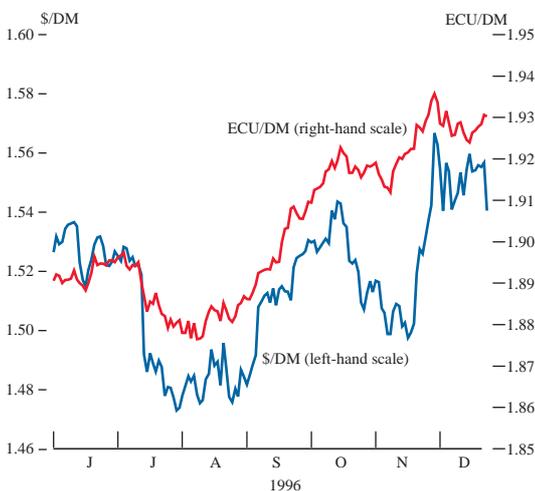


Table C
US dollar exchange rates

	1996 30 Sept.	31 Dec.	Percentage change since 30 Sept.
\$/DM	1.5252	1.5405	1.0
\$/Yen	111.36	116.05	4.2
\$/CHF	1.2535	1.3405	6.9
ERI	97.5	98.4	0.9

Chart 9
Deutsche Mark exchange rates



strong labour market data on 13 November and it rose further the following day buoyed by RPI data which were significantly above market forecasts. Sterling closed at 91.9 on the index on 14 November, an increase of 1.4% in effective terms over two days. The UK Budget was well received by the market and sterling's appreciation continued during the second half of November. It finished November at 94.0 on the ERI and DM 2.5833.

However, exchange rate volatility increased markedly during December, when the market was relatively thin ahead of the year-end. This heightened volatility coincided with comments on 3 December by a Bundesbank Council member, which were interpreted by the markets as suggesting that EMU could boost demand for dollar-denominated assets. The dollar rose sharply in overnight trading and sterling fell through technical support at \$1.6660, triggering increased sales. Moreover, its overnight gains to above DM 2.63 (a post-ERM high) were not sustained as it ran into profit-taking. A feature of this episode appears to have been large volumes of technically driven sales of sterling, and it closed at DM 2.5295 on 5 December, a 4% fall in less than 48 hours. Chart 7 shows the volatility in the options market as exchange rate uncertainty, particularly in the short term, increased.

But these chartist-driven selling pressures were short-lived; technical support was apparent at DM 2.5150, and sterling subsequently appreciated against the Deutsche Mark. The decision to leave UK official interest rates unchanged at December's Monetary Meeting had little impact on the exchange rate which continued to appreciate (within its post-October trading up-channel against the Deutsche Mark). It finished the year at DM 2.6373, an increase of 19% and 10½% over the course of 1996 and the fourth quarter respectively.

The spread between expected short-term US and German rates narrowed during the fourth quarter; but the dollar was largely unaffected by this background and it strengthened modestly against the Deutsche Mark, rising from DM 1.5252 to DM 1.5405. Japanese interest rate expectations, which were volatile during the third quarter as expectations that monetary policy would be tightened rose and then unwound, were more stable in this period. The US dollar traded in a range between ¥110.90 and ¥116.60 against the Japanese yen during the period.

The dollar strengthened against core ERM currencies over the fourth quarter, reflecting in part the perception that the agreement on the stability pact, reached at the Dublin Summit on 10 December, had further increased the likelihood of a 'wide' EMU. The dollar and the Ecu both reached their highest levels against the Deutsche Mark towards the end of December. The Finnish markka joined the ERM on 14 October, at a central rate against the Deutsche Mark of FIM 3.04. The Italian lira resumed full participation in the mechanism from 25 November, at a central rate against the Deutsche Mark of Lit 990.004. The Irish pound strengthened with sterling, aided by a modest rise in Irish money-market rates, and it finished the fourth quarter more than 8% above its DM central rate (see Chart 10). The Swiss franc depreciated by 7% in effective terms during the fourth quarter. In part this reflected an easing of monetary policy by the Swiss National Bank, amid continuing signs of weakness in the Swiss economy.

Chart 10
ERM exchange rates: divergence from the Deutsche Mark central rate

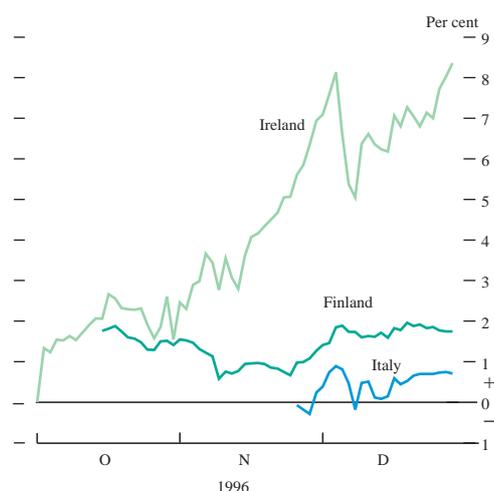
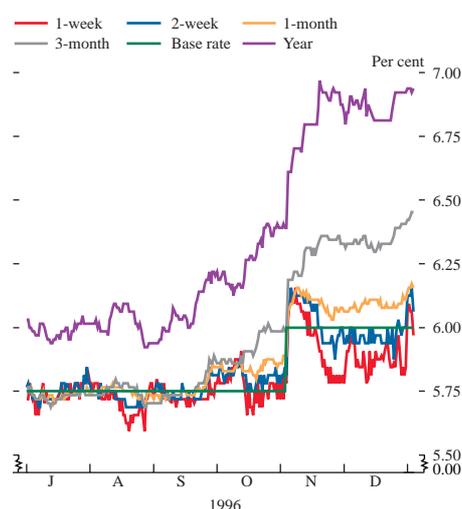


Chart 11
Sterling interbank interest rates^(a)



(a) Middle-market rates at 4.30 pm.

Table D
Influences on the cash position of the money market

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

	1996/97		1996/97	
	Apr.–Sept.	Oct.	Nov.	Dec.
CGBR (+)	16.5	-4.1	3.5	1.8
Net official sales of gilts (-) (a)	-19.2	-4.1	4.2	-2.5
National Savings (-)	-3.2	-0.5	-0.4	-0.1
Currency circulation (-)	0.2	-0.1	-1.7	-0.1
Other	1.7	-1.2	-0.9	0.4
Total	-3.9	-10.0	4.7	-0.5
Increase (+) in the stock of assistance	1.8	8.0	-6.4	-0.2
Net increase (-) in £ Treasury bills in the market (b)	2.9	1.1	1.6	1.1
Increase in bankers' balances at the Bank	0.8	-0.8	-0.1	0.5

(a) Excluding repurchase transactions with the Bank.

(b) Excluding repurchase transactions with the Bank (market holdings include Treasury bills sold to the Bank in repurchase transactions).

Operations in the money markets

The Bank announced a Minimum Lending Rate of 6% at noon on 30 October, an increase of 25 basis points in official interest rates. From early in the period the money markets had become progressively more bearish about the prospects for interest rates, influenced to a large extent by higher-than-expected retail price inflation, and by continued signs of improving economic activity. Nevertheless, a rise in official rates at the October Monetary Meeting was less than fully discounted, and resulted in a sharp upward movement in the interest rates implied by short sterling futures contracts. The immediate impact of the rate rise on short sterling futures and options, and the information on market expectations that can be derived from this, are discussed in the accompanying box.

After the move in official rates, market expectations of the path of short-term interest rates were revised up further, as the market continued to be strongly influenced by retail price inflation releases and also by accumulating evidence of robust activity. The market's increasingly bearish mood was illustrated by the 'pivoting' of very short-term money-market rates in the last two months of the period. Pivoting is a commonly observed phenomenon when the market attaches a high probability to a change in official interest rates in the near term: in this case, market expectations of a rise in official rates caused market interest rates at one month to rise to a level above the existing level of official interest rates (at which the Bank provides liquidity in its money-market operations), while market interest rates at shorter maturities generally traded below the level of official rates, as ample bill offers were generally made to the Bank in its daily operations.

By the end of the year, the three-month forward rate curve implied by short sterling futures contracts had flattened, with mean expectations of rates implied by the March and June 1997 contracts rather higher than in the immediate aftermath of the rise in official rates, but with less change in contracts beyond the end of 1997. This suggested that the market had brought forward its expectation of the timing of monetary tightening, but not the extent of the tightening. At the end of the period, implied interest rate distributions calculated using options on short sterling futures contracts suggested that the market attached a 75% probability to the March 1997 short sterling contract settling at an implied rate of 6.5% or above, and that a 50% probability was attached to the June 1997 contract settling at an implied rate of 6.75% or above.

Management of the profile of the daily money-market shortages was facilitated by an increased provision of liquidity through the Bank's twice-monthly gilt repo facility. This reduced the amount of liquidity which would otherwise have had to have been supplied in the daily operations, which had been forecast to be large owing both to seasonal influences and the impact on the money market of settlement of the dual gilt auction at the end of October. Demand for liquidity at the first two gilt repo rollovers of the period, on 9 and 23 October, was substantial, partly reflecting the increasing probability which the market attached to a rise in official interest rates at the end of the month; this increasing probability was also expressed in a shift in the balance of the funds applied for towards the longer of the maturities on offer at the rollovers. The Bank

Estimating market expectations of short-term interest rates

The prices of financial assets and derivative securities are a potentially rich source of information for policy-makers and market practitioners. Central banks routinely use bond prices or the prices of interest rate futures to examine implied levels of future interest rates. This enables an evaluation of market participants' views as to the likely course and credibility of monetary policy. Using bond prices or futures prices, however, restricts attention to the market's implied expected future interest rate; that is, the weighted average outcome where the weights are the different probabilities attached to different possible interest rates in the future. But by using option prices it is possible to construct an entire implied probability distribution (or probability density function (PDF)) for future interest rates. These PDFs permit a much richer analysis of the alternative probabilities associated with alternative future levels of interest rates.

Using the information contained within option prices is not new. Market practitioners frequently use estimates of implied volatility 'backed out' from the prices of options using, for example, the Black-Scholes formula.⁽¹⁾ Indeed, this notion of the implied variability of asset prices is so common that within many options markets prices are quoted in terms of implied 'vols'. This conveys how variable the underlying asset price is expected to be over the remaining life of the option. What is relatively new, however, is the use of techniques that recover the probabilities⁽²⁾ that traders are implicitly attaching to alternative outcomes when pricing options. At the Bank, these implied probability distributions for short-term UK and German interest rates are now used to contribute on a regular basis to our assessment of monetary conditions.⁽³⁾

In estimating implied interest rate distributions, the Bank uses the options on the short sterling and euromark futures contracts that are traded at LIFFE. These contracts have a quarterly cycle with expiry dates within March, June, September and December. At any one time four quarterly options contracts are being traded. Since the technique allows the recovery of the probability

distribution for interest rates at the expiration of the option contract, it is possible to determine four PDFs at any one time. In January 1997, for example, it was possible to calculate implied PDFs for interest rates at March, June, September and December 1997.

An important use for this technique is in assessing the impact of particular events upon the probabilities the market attaches to various possible future levels of interest rates. How, for example, were the market's perceived probabilities affected by the increase in official interest rates from 5.75% to 6% at the end of October last year? To what extent did the market predict the rise before the event? Using LIFFE short sterling futures prices, we can throw some light on these questions.

Chart A
Implied short sterling forward curve

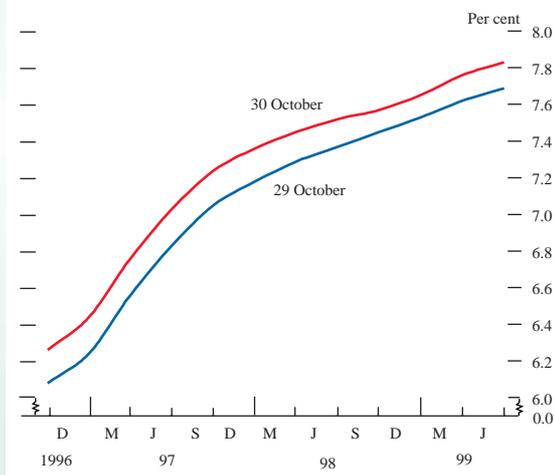


Chart A portrays the implied forward interest rate curve at the close of business on 29 and 30 of October. This curve captures the market's mean path for future three-month interbank interest rates.

Both curves are upwards sloping, suggesting that the market perceived that interest rates were likely to increase over time. Despite this, when official rates were increased at noon on the 30th, a broadly parallel shift in

(1) Black, F and Scholes, M. (1973) 'The pricing of options and corporate liabilities', *Journal of Political Economy*, Volume 81.

(2) Technically these techniques permit recovery of a 'risk-neutral' probability density function. To the extent that investors are risk-averse the implied risk neutral distribution may diverge from the 'true' probability distribution perceived by investors.

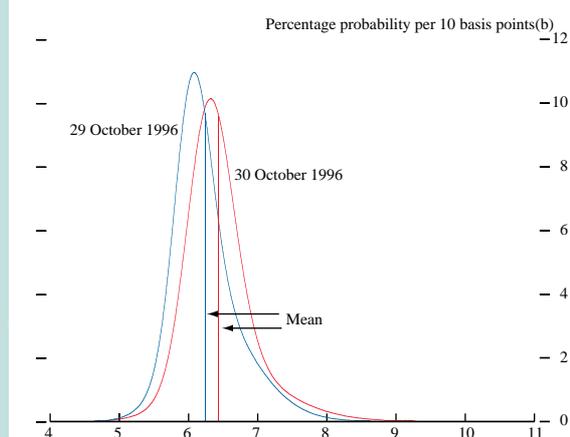
(3) The details of the estimation procedure the Bank uses to construct these PDFs is set out in an article entitled 'Probability distributions of future asset prices implied by option prices' in the August *Quarterly Bulletin*, 1996, pages 299-311, and in 'Implied risk-neutral density functions from option prices: theory and application', Bank of England *mimeo*, both by Bhupinder Bahra. PDFs were also discussed in a box 'Short-term interest rates in the United Kingdom and Germany: estimating market expectations', in the August 1996 *Inflation Report*.

injected net liquidity of £2.7 billion and £1.0 billion at these two rollovers, which represented 53% and 33% respectively of the liquidity bid for. A further net increase in the liquidity via the facility at the rollover on 6 November took the total amount outstanding to £6.5 billion, which was both the highest amount provided by way of the facility for the year, and since the facility

the implied forward curve of approximately 20 basis points resulted. The implication of this is that the market was surprised by the timing of the authorities' decision to increase rates. This conclusion is also supported by market commentary at the time.

But it would also be useful to know additional information such as whether the probabilities of future changes were also altered by the rate move. In other words, did traders expect that a further rate rise was more likely following the decision to raise rates? Chart B

Chart B
Implied distribution for three-month sterling interbank rates at March 1997^(a)

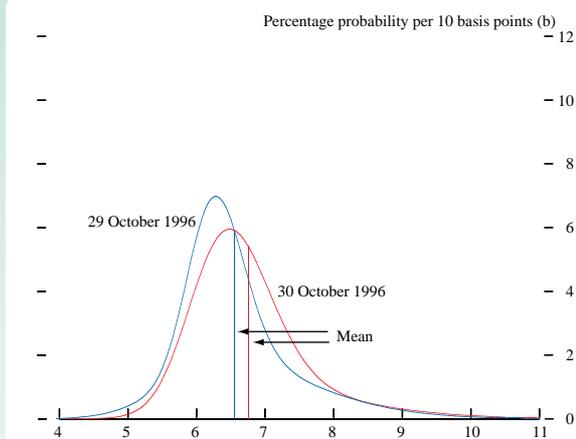


- (a) At close of business on 29 October and 30 October 1996.
(b) The probability density indicates the likelihood of particular events occurring. Thus the probability density associated with interest rate x is approximately equal to the probability of the outcome lying in a corridor 5 basis points either side of x . Moreover, the probability of the rate lying between $x\%$ and $y\%$ at the terminal date is given by the area under the probability density curve between these two points. The area under the whole curve is always 100%.

shows the implied PDFs calculated using the option contract expiring in March 1997 based on LIFFE settlement prices for 29 and 30 October. Chart C gives the implied distribution for options expiring in June 1997 calculated on the same dates.

Like the mean outcome implied by futures prices, the implied distributions shifted significantly following the change in the base rate. The vertical lines represent the mean of the distribution. This should in theory be equal to the mean interest rate implied by the short sterling futures price underlying the option contract. It is no surprise then that the effect of the base rate change was to shift the means of the distributions to the right by approximately 20 basis points in a manner entirely consistent with the upwards shift in the implied forward

Chart C
Implied distribution for three-month sterling interbank rates at June 1997^(a)



- (a) At close of business on 29 October and 30 October 1996.
(b) See footnote (b) to Chart B.

curve. The added value of estimating these PDFs though, lies in examining the evolution of the probabilities attached to outcomes either side of the mean.

The charts show that the distributions are positively skewed. Intuitively, this means that the market attaches higher probabilities to the interest rate being much higher than the mean for the future date than it does to it being an equivalent amount lower. Another feature is that the distributions are flatter as the time-to-maturity of the options increases. This makes sense since the market is likely to be more uncertain as to the level of future interest rates the further into the future one looks.

For the March 1997 contract the market appears to have changed its assessment between 29 and 30 October by reducing the probabilities associated with rates being less than 6.25% at that date and increasing the probabilities associated with rates being greater than 6.25%, particularly in the range from 6.25% to 7.25%. This suggests that the market perceived an increased chance of further increases in official rates following the rise on 30 October. A similar picture emerges for the June 1997 distribution. In this case the market increased the probabilities it attached to interest rates lying above 6½%, and reduced the probabilities attached to interest rates lying between 5½% and 6½% in particular. An interpretation of this is that, following the October rate rise, the market perceived a higher probability of there being relatively large increases in interest rates by June.

was introduced on a formal basis in January 1994. The Bank also relieved some of the anticipated pressure on the size of the daily money-market shortages by reducing the size of the weekly Treasury bill tender, from £400 million to £200 million, with effect from 11 October, taking the size of the weekly tender to its lowest level for the year.

The Bank of England's operations in the sterling money markets

On 4 December the Bank published proposals for changes in its daily operations in the sterling money markets, through which it implements monetary policy. On 20 December it issued for consultation a draft operational notice for these operations and a draft legal agreement for counterparties. The Bank received helpful comments from a wide range of participants in the sterling markets, many of which are reflected in its definitive plans published on 4 February. The Bank plans to start the new operating arrangements on 3 March.

The Bank's plans take account of the successful development of the gilt repo market,⁽¹⁾ which began operating in January 1996. Gilt repo has developed to the point where it has become, in essence, a modern form of secured money, appropriate to be used in the Bank's daily operations in the money market. In addition, the Bank will broaden the range of counterparties able to participate in its daily operations, and make some technical changes to its late lending arrangements. These developments, though evolutionary in character, nonetheless represent a substantial development of the Bank's operations to take account of the changing market environment. The Bank believes that they will have the effect of enhancing the scope for banks and other sterling market participants to manage their day-to-day liquidity and, more generally, foster the continuing development of efficient and competitive sterling money markets.

Changes to daily open market operations

The Bank will extend its daily open market operations to include gilt repo, as well as continuing operations, as at present, in Treasury bills and eligible local authority and bank bills; in addition, marketable HM Government foreign currency debt may be used. The Bank will invite its counterparties to bid for funds by way of repo of gilts, eligible bills and/or marketable HM Government foreign currency debt, and/or outright sale of eligible bills. The maturity for the Bank's operations in repo will be around two weeks, although there may be minor variations from day to day in order to smooth the future pattern of daily shortages/surpluses; the Bank will be prepared to purchase outright eligible bills with a residual maturity up to the longest-dated repo invited. The Bank will also change the timing of its afternoon operation: in recent years the need for market participants to be active in managing their liquidity right up until market trading ends for the day suggests that the current time of 2.00 pm is earlier than is desirable. Following consultation with the market, the Bank has decided to move its afternoon operation to 2.30 pm.

Counterparties

The Bank will broaden the range of counterparties able to participate in its daily open market operations, to include market participants active in the gilt repo and/or bill markets. The Bank's present main counterparties are the discount houses, all of which are active participants in the bill and/or

gilt repo markets. In future, banks (including discount houses), building societies and securities firms who wish to participate in the Bank's daily operations may do so, provided they meet certain functional requirements. These are that they:

- have the technical capability to respond quickly and efficiently to the Bank's operations;
- maintain an active presence in the gilt repo and/or bill markets, thus contributing to the distribution of liquidity around the system;
- participate regularly in the Bank's operations; and
- provide the Bank with useful information on market conditions and developments.

There will be no requirement for the Bank's money-market counterparties to be separately capitalised or specialist entities, and there will be no special supervisory arrangements for counterparties *per se*; prudential oversight of their activities as a whole will remain with their existing supervisor. The Bank will not publish a list of its money-market counterparties. The Bank is also ending its separate capitalisation requirement and the associated specialist supervisory arrangements for the gilt-edged market-makers.⁽²⁾

End-of-day arrangements

The Bank will make changes to its existing late lending arrangements, through which it is prepared, within limits, to lend secured money at the end of the day to adjust for any late imbalance in the market. Moving the final round of open market operations from 2.00 pm to 2.30 pm should reduce the need for access to late financing from the Bank. Nevertheless, because late imbalances can inevitably arise, there will be a need for some form of late financing for the settlement banks, which provide wholesale payments services to the rest of the market and which need to balance their settlement accounts at the Bank at the end of the day. The Bank will therefore provide a late financing facility for the settlement banks in the form of overnight repo and, for a transitional period, it will continue to provide a similar facility for the discount houses.

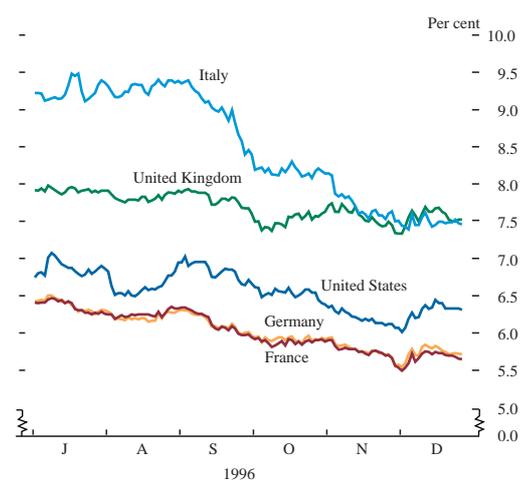
Next steps

Discussions have been held with a number of institutions which have expressed an interest in becoming counterparties. There is no presumption that all potential money-market counterparties must be ready to participate by the start date: the Bank will be prepared to take on new counterparties which fulfil the criteria at any time. Institutions which are interested in becoming counterparties should contact the Head of Gilt-Edged & Money Markets Division at the Bank.

(1) The introduction and development of the gilt repo market are described in articles in the May and November 1996 *Quarterly Bulletin*, and in boxes in the August and the current edition of this article.

(2) The removal of the requirement for gilt-edged market-makers to be separately capitalised is discussed in the article, 'The gilt-edged market: developments in 1996', pages 63-74.

Chart 12
Ten-year benchmark yields^(a)



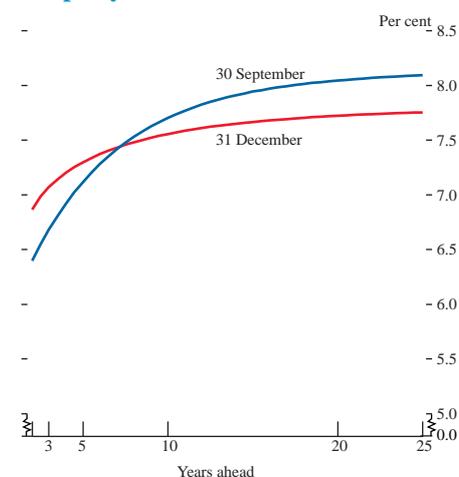
(a) Gross redemption yields on a semi-annual basis.

Table E
Total unhedged return on ten-year government bonds (in sterling terms), 30 September to 31 December 1996

Per cent

	Security component	Currency component	Total return in sterling terms
UK Gilts	2.98	0.0	2.98
US Treasuries	4.38	-8.64	-4.64
German Bunds	3.59	-9.55	-6.30
French OATs	4.04	-9.22	-5.55

Chart 13
Gilt par yield curves



Gilt yields and inflation expectations⁽¹⁾

Ten-year government bond yields fell in all G7 countries. US Treasuries benefited from the better-than-expected prospects for US inflation, and German bunds from continued evidence of non-inflationary economic growth, and later from a perception that actual growth might be below market expectations. The government bonds of the previously 'high-yielding' EU countries significantly outperformed those of 'core' countries, although the rate of this outperformance slowed towards the end of the period.

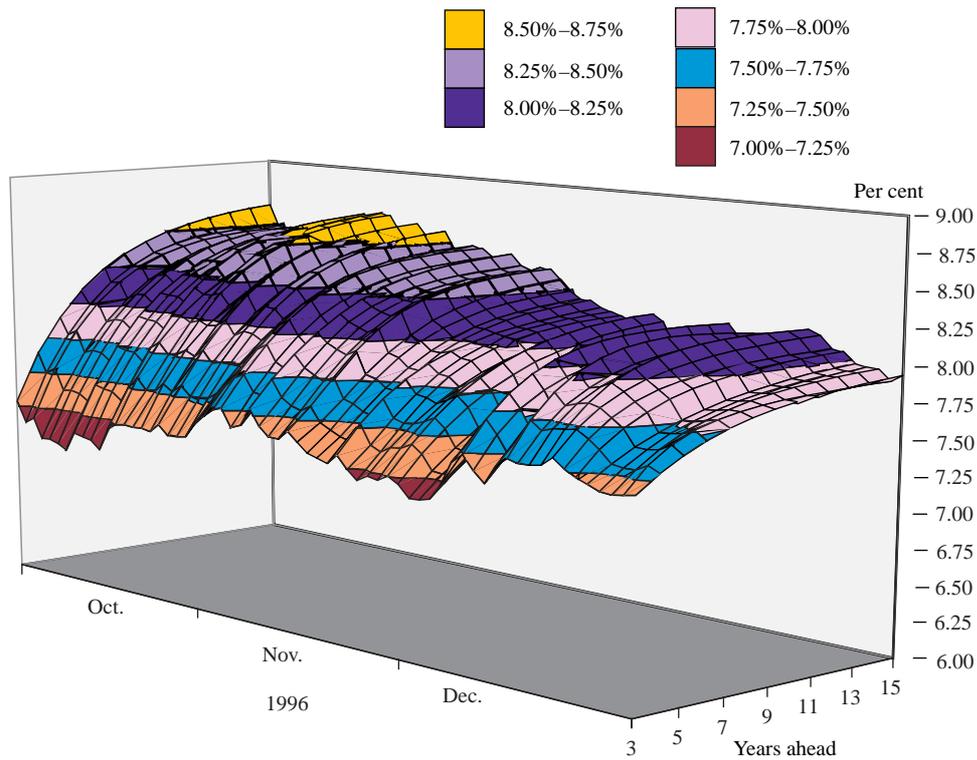
The gilt market underperformed other major government bond markets when performance is measured in terms of changes in yields, although gilt yields did decline at longer maturities over the period. Table E shows that, while ten-year gilts underperformed other major markets in domestic currency terms, one result of sterling's strong and broad-based appreciation was that they outperformed when the performance is measured in terms of total return—that is, taking into account the change in price, plus the reinvestment of any coupon paid on the bond, plus the change in the value of the currency.

Over the period as a whole, the yield curve flattened: short-term yields rose while those at longer maturities fell. The yield on ten-year gilts declined by 12 basis points to 7.48% by the end of December. Gilts participated in the international rally in bond markets in early October which followed the decision by the FOMC to leave US official interest rates unchanged at its September meeting. But sentiment in the gilt market turned in October following the release of domestic inflation and employment data. Following the 25 basis point rise in UK official interest rates on 30 October, yields rose across much of the curve but by rather more at the short end, resulting in a significant flattening of the curve. The gilt market rallied in November and early December, with declining yields on European bonds, the strength of the exchange rate and an unexpectedly large public sector debt repayment in October being supportive factors. The UK Budget, which was presented on 26 November, resulted in very little change in gilt yields. Yields rose slightly towards the end of the period, however, as government bond markets worldwide interpreted remarks by the Chairman of the US Federal Reserve Board as suggesting that asset prices might be overvalued, and, later, to a series of stronger-than-expected US economic data.

While longer-term par yields declined by less in the United Kingdom than in the United States and Germany, UK six-month implied forward rates at five and ten years fell by more than in these countries. Over the period as a whole, UK six-month implied forward rates declined by 43 basis points at five years, and by 76 basis points at ten years. That compares with declines of 30–35 basis points at five and ten years in both the United States and Germany. At the end of the period, the UK six-month implied forward rate at ten years was 7.88%, compared to 7.68% for Germany. Thus, while the market revised up its expectation for the path of UK short-term interest rates in the near future, it implicitly revised down its expectation of the path of short-term interest rates further out. This is consistent with the decline of 12 basis points

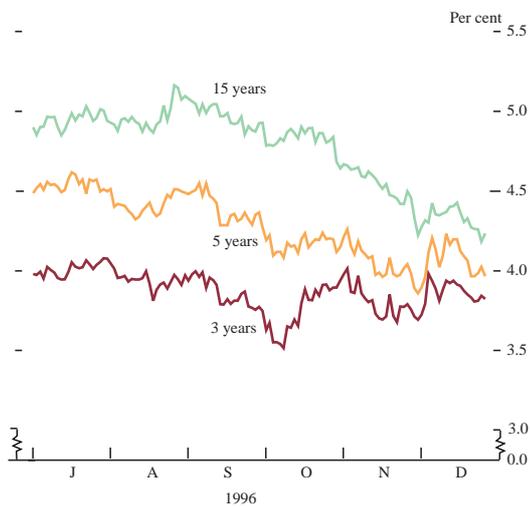
(1) Developments over 1996 as a whole are described in 'The gilt-edged market: developments in 1996', pages 63–74.

Chart 14
UK six-month implied forward rates



This 3D surface illustrates how the implied forward rate curve has evolved day by day. The shading emphasises the level of forward rates at any given point on the surface. The implied forward rates are annualised six-month interest rates derived from the zero-coupon yield curve.

Chart 15
Inflation expectations at 3, 5 and 15 years^(a)



(a) Implied annualised inflation in the six-month period beginning 3, 5 and 15 years ahead.

over the period in the ten-year par yields (the ten-year par yield reflects the geometric average of the path of expected short-term interest rates over the next ten years).⁽¹⁾

The flattening of the yield curve in this period was reflected in a flattening of the implied forward inflation expectations curve. Short and longer-term six-month forward inflation expectations converged towards 4% by the end of the period, with the short-term expectations rising and longer-term expectations falling significantly: three-year expectations rose by 5 basis points to 3.82% by the end of the period, while five-year expectations fell by 40 basis points to 3.97% and 15 year expectations fell by over 70 basis points to 4.17%.

Gilt financing

Gilt sales and financing requirement

Following the Budget, the gilt sales requirement for the 1996/97 fiscal year was revised downwards slightly, from £39.9 billion as at end-September to £38.4 billion. As Table G shows, the main factor behind the lower requirement for gilt sales was the increase in the assumed contribution from sales of National Savings products, reflecting their strong performance. There was also a small reduction in the CGBR forecast for the year.

Gilt sales in the fiscal year to the end of December amounted to £29.1 billion, of which 17.5% was raised through index-linked

(1) The decomposition of ten-year yields and yield differentials are discussed in an article 'Recent yield curve behaviour—an analysis' by Bill Allen on pages 43–8.

Table F
Official transactions in gilt-edged stocks

£ billions: *not seasonally adjusted*

	1996/97		1996/97	
	Apr.–Sept.	Oct.	Nov.	Dec.
Gross official sales (+) (a)	22.3	4.1	0.2	2.5
Redemptions and net official purchases of stock within a year of maturity (-)	-3.1	0.0	-4.4	0.0
Net official sales (b)	19.2	4.1	-4.2	2.5
<i>of which net purchases by:</i>				
Banks (b)	1.4	0.3	-2.1	0.9
Building societies (b)	0.4	0.5	-0.9	0.2
M4 private sector (b)	12.9	0.3	-2.0	2.5
Overseas sector	3.8	2.9	0.9	-0.9
LAs and PCs (c)	0.8	0.2	0.0	-0.3

(a) Gross official sales of gilt-edged stocks are defined as official sales of stock with over one year to maturity net of official purchases of stock with over one year to maturity apart from transactions under purchase and resale agreements.

(b) Excluding repurchase transactions with the Bank.

(c) Local authorities and public corporations.

Table G
1996/96 financing requirement

£ billions

	Original remit	At end-Sept.	Post-Budget
CGBR forecast	24.1	28.1	27.9
Net change in official reserves	0.0	0.0	0.0
Gilt redemptions	11.5	12.5	12.5
Under/overfund from 1995/96	0.0	2.1	2.2
Financing requirement	35.6	42.7	42.6
Assumed contribution from National Savings	3.0	3.0	4.5
Expected contribution from certificates of tax deposit	0.0	-0.2	-0.3
Gilt sales required	32.6	39.9	38.4

sales and the remainder through conventionals. The maturity distribution of conventional sales reflected the pattern of auctions to end-December, being skewed away from medium-dated stocks (which were auctioned twice in the first nine months of the fiscal year, and accounted for 23% of conventional gilt sales) and towards short and long-dated stocks (which were each auctioned four times, and accounted respectively for 41% and 36% of conventional gilt financing). For the fiscal year as a whole, the government's remit specified that the Bank would aim to distribute conventional gilt sales roughly equally across the three maturity bands; this aim was reflected in the maturity ranges announced at the end of December for auctions in the last quarter of the fiscal year. The schedule included two issues of medium-dated stocks, and one each of short and long-dated.

Auctions

The results of the auctions held in October and December are summarised in Table H. As usual, no auction was held in November on account of the Budget.

October was the second of the 'dual' auctions scheduled for the year, the first having been held in July. The authorities repeated the basic pattern of the successful July auction, auctioning a total of £3.5 billion (less than the maximum £4 billion allowed under the remit), by combining two stocks at near-opposite ends of the maturity spectrum—the 7% Treasury 2001 and the 8% Treasury 2015. This was intended to maximise the potential appeal across different investors, and also had the effect of weighting the amount of issuance towards the shorter-duration, less risky stock. The results of the auctions were encouraging in that both generated very high levels of bidding and tight pricing, as evidenced by the cover and 'tail' statistics. Demand appears to have been stimulated by the perceived attractiveness of gilts relative to other markets at the time; in the run-up to the auction, European government bond prices trended higher while gilts tended to fall, and on the eve of the first auction the ten-year yield spread between gilts and bunds stood at 171 basis points, having dipped below 150 basis points earlier in the month. Perhaps more significant than the cover and tail statistics, however, was the fact that market participants appear

Table H
Gilt issuance

Date	Stock	Amount issued (£ millions)	Of which, to CRND	Price at issue (per £100 stock) (a)	Yield at non-competitive allotment price (b)	Yield at issue	Yield when exhausted (c)	Average yield (d)	Cover (e) at auctions	Tail (f) at auctions (basis points on yield)	Date exhausted
Auctions of Conventional stock											
22.10.96	7% Treasury Stock 2001	2,000	0	99.53125	7.10	n.a.	n.a.	n.a.	3.57	0	22.10.96
24.10.96	8% Treasury Stock 2015	1,500	0	101.34375	7.86	n.a.	n.a.	n.a.	2.66	0	24.10.96
4.12.96	7% Treasury Stock 2002	2,500	0	99.40625	7.13	n.a.	n.a.	n.a.	1.70	2	4.12.96
Tap Issues of Conventional Stock (including to CRND) (g)											
28.11.96	7¾% Treasury Stock 2006	100	0	101.96875 (h)	n.a.	7.46	7.46	7.46	n.a.	n.a.	28.11.96
Tap Issues of Index-Linked Stock											
15.10.96	2½% Index-linked 2001	150	0	185.5625	n.a.	3.10	3.09	3.09	n.a.	n.a.	15.10.96
15.10.96	2½% Index-linked 2013	150	0	146.3125	n.a.	3.50	3.50	3.50	n.a.	n.a.	15.10.96

n.a. = not available.

(a) Non-competitive allotment price.

(b) Gross redemption yield per cent based on the weighted average price of successful competitive bids.

(c) Gross redemption yield or real rate of return (assuming 5% inflation) based on the price when the issue ceased to operate as a tap.

(d) Weighted average gross redemption yield or real rate of return (assuming 5% inflation), based on actual price at which issues were made.

(e) Total of bids divided by the amount on offer.

(f) Difference in gross redemption yield between the weighted average of successful competitive bids and the lowest accepted competitive bid.

(g) Various official funds under the management of the Commissioners for the Reduction of the National Debt.

(h) Issued with no minimum price.

to have focused on the second of the two auctions in advance of the first taking place, whereas in July there had been very little pre-auction positioning in the second of the stocks until the day before the auction. This might indicate some increasing confidence on the part of the market in its approach to dual auctions, although at present there is only a small sample on which to judge.

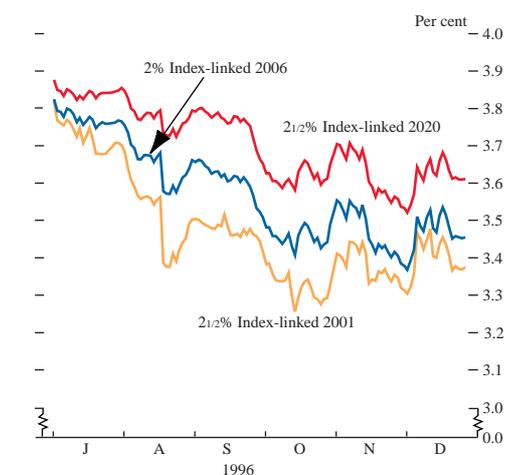
A new short-dated stock was introduced at the December auction, and was intended to provide a new benchmark for the market in the five-year area. The remit had specified that the strippability of new short-dated conventional benchmarks would be decided on a case-by-case basis; in the event, the authorities decided that, having issued largely into non-strippable issues at the short end of the curve in the year to date, the new benchmark should be strippable. The amount to be auctioned, £2.5 billion, was lower than the average in the year to date, reflecting the downwards revision to the gilt sales requirement following the Budget. Although the gilt/bund spread, particularly in the five-year area, was thought by the market to remain at attractive levels, in the event this was not a predictor of strong demand; cover (1.7 times) was below the average for the financial year to date, and the tail (2 basis points) was slightly wider. However, the cover was in line with the long-term average (going back to 1991) for new stocks: historically auctions of new stocks have on average generated slightly lower volumes of bidding, perhaps because fear of the ‘loser’s curse’—opening up a short position and then failing to cover it in the auction—is likely to be strongest when the auction represents the only available supply of stock. Certainly a number of auction participants were cautious about opening shorts in the light of the stock’s expensiveness in the repo market prior to auction—although, as noted in the article on the gilt-edged market in 1996 in this *Bulletin*, there does not as yet appear to be any consistent relationship between the repo behaviour of auction stocks and the auction’s outcome. December auctions have historically generated lower cover than the long-term average, perhaps related to caution ahead of year-ends for some market participants. However, the sample of December auctions is very small and it is not therefore possible to draw firm conclusions on this point.

On 30 December the authorities announced the maturity ranges of auctions during January-March 1997, consisting of a new medium stock in the range 2006–2008 inclusive and a short stock in the range 2001–2003 inclusive for the dual auction on 28 and 30 January; a long stock in the range 2021 or after for 26 February; and a medium stock in the range 2006–2008 inclusive for 26 March.

Conventional taps

One conventional stock was tapped in the quarter, with an issue of £100 million of 7³/₄% 2006 on 28 November. The stock was particularly tight in the repo market at the time, and there had been a large volume of failed deliveries. Being a relatively small amount of stock, the new issue was placed in the ‘Shop Window’ (ie advertised for sale on the Bank’s screen pages), the key difference between this and the usual tap procedures being that no minimum price was assigned to the issue. The issue was exhausted in an initial tender at a ³/₃₂ premium to the middle-market screen price at the time of announcement.

Chart 16
Yields on index-linked government stock



Index-linked gilts

Real yields on index-linked government stock at different maturities had diverged earlier in the year. In the fourth quarter the shape of the real yield curve was little changed, and real yields fell slightly at all maturities. The pace of index-linked sales slowed in this period, following the rapid progress made in the first six months of the financial year towards achieving the annual sales target for indexed gilts (15% of total gilt sales), and also reflecting the reduction in the overall gilt sales requirement after the Budget. Only one package of taps was brought, for a total of £300 million in nominal terms (see Table H for details). The issues were exhausted on the same day. Index-linked sales raised £0.8 billion in total during the quarter, taking sales for the first nine months of the financial year to £5.1 billion, or 88% of the annual target.

Sectoral investment activity

At £2.4 billion, net investment in gilts in this quarter was lower than in the two preceding quarters, reflecting the weight of redemptions. These included £1 billion of 6³/₄% 1995–98 stock called for early repayment on 1 November. Within sectors, net purchases by the overseas sector were very robust, amounting to more than total net sales during the quarter. This reflected strong net purchasing in October and November, which might in turn have stemmed from a variety of factors, including the general attractiveness of gilts and other sterling assets to overseas buyers (where there was widespread anecdotal evidence of strong interest from outside Europe, in particular Japan), and the pattern of holdings of redeemed stocks (the overseas sector is unlikely to have been significant holders of the stocks, the larger of which was non-FOTRA).

ONS statistics for institutional investment for the quarter July-September now provide further detail on the very heavy net purchases by the domestic non-monetary sector during that period. In a quarter where net investment overall by pension funds and long-term insurers was at very high levels, net investment into gilts by these two sectors remained very strong, at £1.5 billion and £2.8 billion respectively.

Technical developments⁽¹⁾

The Bank announced on 3 December that it was putting back its target date for the introduction of the upgraded Central Gilts Office (CGO) system to 26 August 1997. The extension to the timetable was agreed partly in order to allow members to concentrate resources on the phased introduction of CREST; and also to allow sufficient time for a stable upgraded CGO system to be available for trialling, to enable CGO members to feel confident of a smooth transition to the new system.

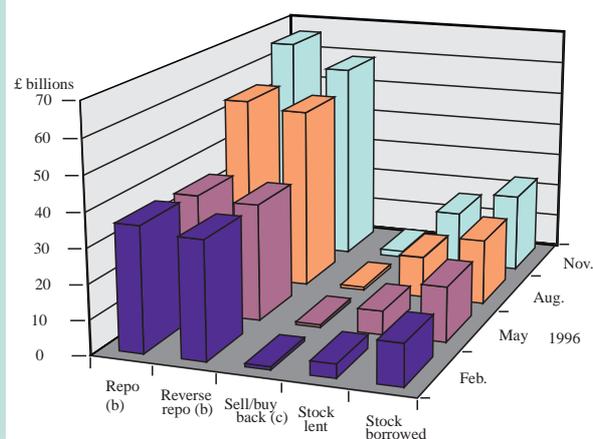
On 4 December the Bank published a consultation paper setting out its proposals on developments to its operations in the sterling money markets (see the accompanying box on page 12). One of the Bank's proposals was that, at the time of the inception of the new operating arrangements, the requirement on its counterparties in both its money-market and gilt-edged operations to be separately

(1) The upgrade to the CGO system and the proposal to end the separate capitalisation requirement for gilt-edged market-makers are described more fully in 'The gilt-edged market: developments in 1996', pages 63–74.

Recent developments in the gilt repo market

The gilt repo market grew nearly 20% in the quarter to end-November, following growth of around 55% in the previous quarter, taking the total amount outstanding to over £65 billion,⁽¹⁾ as measured by data submitted to the Bank on a voluntary basis by market participants. There was also further growth in stock lending, with the reported figure growing by around 25% to about £23 billion outstanding. The combined total of all outstanding of repo-like activity reported to the Bank by around 85 institutions reached nearly £84 billion.

Chart A
Outstanding amounts reported to the Bank^(a)



- (a) Transactions entered into, but for which the second leg has not yet settled.
- (b) Sell/buy back and buy/sell back transactions conducted under an annex to the Gilt Repo Legal Agreement are included under repos and reverse repos respectively.
- (c) The reported levels of sell/buy backs and buy/sell backs are very similar.

Data on the outstanding amounts of gilt repo reported to the Bank will in future be published in the Bank's new monthly publication, *Bank of England: Monetary and Financial Statistics (Bankstats)*, first issued in January 1997. New data will be available in the April edition, showing data for end-February, and quarterly thereafter, although any revisions to back data will, of course, be included in *Bankstats* in the intervening months. In future, therefore, new data on the size of the gilt repo market will first be available in *Bankstats*.

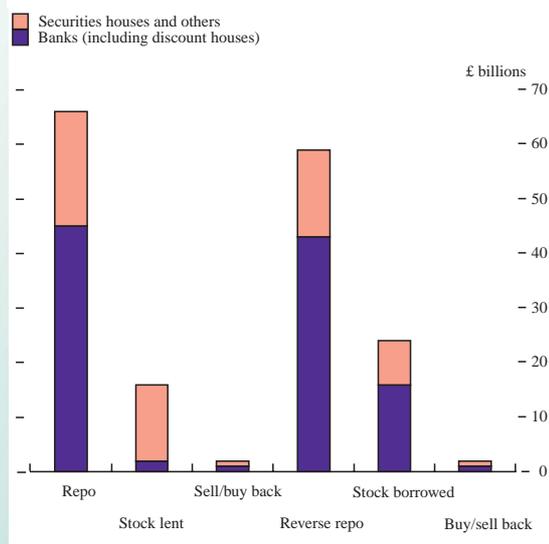
The November monetary statistics compiled by the Bank reflected the rising trend in the market as a whole. At the end of November 1996, gilt repos reported on banks' and building societies' balance sheets reached £40 billion, up around 21% from August, and reverse repos rose to £43 billion, up nearly 8%. Unlike the data reported to the Bank on a voluntary basis, which are reported gross, the balance sheet data may be reported net of offsetting transactions with the same counterparty where the maturity of the reverse repo is less than or equal to that of the repo, in line with accounting conventions. The December monetary statistics showed a fall in both repo and reverse repo outstandings, to £29 billion and

£32 billion respectively. The fall was consistent with market reports of reduced activity in December, and is believed to be partly due to end-of-year balance sheet adjustments made by numerous financial institutions and their banking counterparties, and also due to the decline in trading activity in repos and other instruments over the holiday period.

On 4 December, the Bank published proposals for changing its daily money-market operations, which included broadening the range of instruments to include gilt repos and extending its range of counterparties (see the box on page 12). This led to increased interest in the gilt repo market, with numerous enquiries being made to firms active in gilt repo. However, December is traditionally a quiet period in both bond and money markets, and this interest did not translate into increased activity in the short term. Over the longer term, it is widely expected that the Bank's proposals will contribute to the further growth of the gilt repo market. This is likely to arise both as a result of increased gilt repo activity by direct counterparties to the Bank's daily operations, and as the Bank's counterparties transform the system liquidity provided by the Bank into the maturities desired by the market.

Data to end-November show that banks, including the discount houses, continue to account for the largest share of gilt repo activity and outstandings (see Chart B). The discount houses as a group have a substantial share of

Chart B
Outstanding amounts by practitioner



banks' repo business. Securities houses' activity has continued to increase, and other types of institution are becoming more actively involved. Provision of data by institutional investors (or their fund managers) remains limited, and continues to be the main reason for the

(1) The comparable figure for end-August has been revised down from £58 billion to £55 billion, following corrections to previously submitted figures. Figures reported here were correct at the time of going to press.

discrepancy between reported stock lending and borrowing, as institutional investors remain the main lenders of stock into the market.

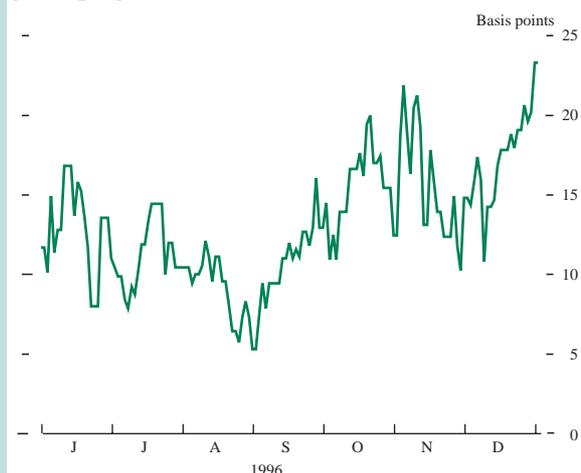
Table A
Outstanding amounts at end-November 1996 by residual maturity^(a)

£ billions	On call and next day	2-8 days	9 days-1 month	1-3 months	3-6 months	Over 6 months	Total
Repo	12	24	14	13	1	1	66
Stock lent	12	2	1	1	0	0	16
Sell/buy back	0	1	1	1	0	0	2
Total out	25	27	15	14	1	1	84
Reverse repo	13	20	12	12	2	1	59
Stock borrowed	15	4	3	1	0	0	23
Buy/sell back	0	1	0	0	0	0	2
Total in	28	25	15	13	2	2	84

(a) Totals may not sum due to rounding.

The end-November snapshot of the residual maturities of repo trades outstanding showed a marked increase in the value of trades with one to three months' and two to eight days' remaining maturity, while the proportion of nine-day to one-month trades outstanding fell. Reported turnover in repo during the quarter reached nearly £18 billion per day, up from around £15 billion previously. There was an increase in the proportion of turnover in maturities longer than eight days; up from 8% to 11%. The average reported transaction size in repos was around £38 million, and £37 million in reverse repos; although much larger trades are common in repo as a general collateral money-market instrument, the *average* size reflects the inclusion of special repo trades (in scarce stocks), the size of which tends to be much smaller.

Chart C
Three-month interbank rate minus three-month gilt repo general collateral rate^(a)



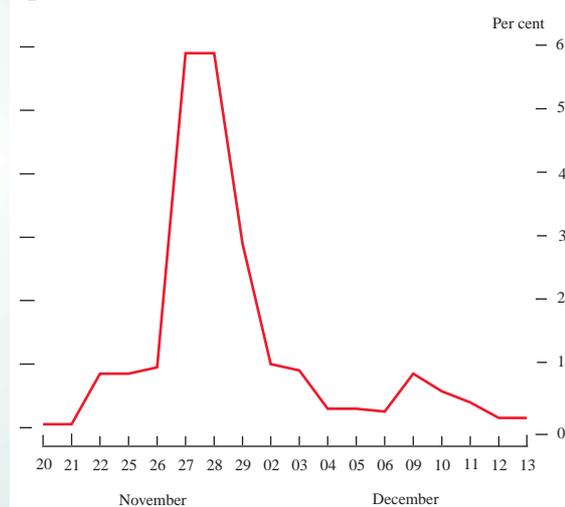
(a) Middle rates collected by the Bank at 10.15 am. Data on GC rates are now available monthly in *Bankstats*.

Three-month general collateral (GC) rates continued to trade at several basis points below the comparable interbank rate in the final months of 1996. This became more pronounced towards the end of December, when demand for year-end liquidity caused interbank (unsecured

finance) rates to be bid up, meaning that secured funds could be obtained at a greater discount than usual to unsecured money. The reduced demand for repos (evident in the monetary statistics) may also have tended to depress GC rates.

Several scarce stocks traded special (at a premium to GC) for short periods in the final quarter of 1996. In particular, there was a lot of activity in 7³/₄% 2006 in late November, when there was an increase in demand for the stock, mainly because investors switched out of a similar maturity stock as it approached its ex-dividend period. Market-makers and others, having sold the stock to meet this demand, then sought to cover their short positions in the repo market. However, a large proportion of the stock was apparently held by investors who do not currently lend or repo their stock, limiting its supply to the market, and causing the special rate to trade at close to 0% and the failure of some trades to be settled. In response to this excess demand, the Bank issued a small amount of stock to help relieve the market's temporary difficulties, selling £100 million of the stock on 28 November.

Chart D
Special rate on 7³/₄% 2006^(a)



(a) Indicative one-week special rate, expressed in basis points below the prevailing one-week general collateral repo rate.

At the start of 1997, there was tightness in 6³/₄% 2004, and some market participants again reported that there had been cases of counterparties failing to deliver stock in accordance with their contractual obligations. Such failures to deliver remain very unusual in the cash gilt and gilt repo markets. Market participants are advised by the Gilt Repo Code of Best Practice to sub-divide any large trades into smaller sizes, to reduce the risk of non-receipt of a small amount of stock resulting in a failure to deliver onwards a larger volume of stock to a further counterparty. The Code also makes clear that market participants are free to agree to accept partial deliveries of stock.

The May *Quarterly Bulletin* will have a full-length article covering the current size and structure of the gilt repo market, and developments in the market in its first full year.

capitalised and subject to specially tailored supervisory arrangements should cease.

A further conversion offer between two stocks was announced on 29 October. As with the offer made in August, its purpose was to build up the pool of strippable stocks in advance of the strips market starting. The offer involved converting out of 12% Exchequer Stock 2013–17 into the strippable 8% Treasury Stock 2015, with terms being fixed on 12 November and the offer closing on 3 December. As before, the vast majority of holders by value chose to accept the offer, with a take-up rate of 94.3%. Nearly £1.3 billion was added to the strippable stock, while the source stock was reduced to below £100 million, putting it on the list of small illiquid stocks for which the Bank is prepared to offer a price to market-makers to ensure that a bid price is always available for remaining investors. In total the two conversion offers have added nearly £2.8 billion to the pool of strippable stocks.

UK Government ECU issuance

The United Kingdom continued to hold regular monthly tenders of ECU 1 billion Treasury bills during this period, comprising ECU 200 million of one-month, ECU 500 million of three-month and ECU 300 million of six-month bills. The tenders continued to be oversubscribed, with issues being covered by an average of 3.0 times the amount on offer. For 1996 as a whole, average cover was 2.5 times, compared with an average of 2.4 times in 1995. Within this period, bids were accepted at average yields up to 14 basis points below the ECU Libid rate of the appropriate maturity, with bidding particularly strong in the December tender. There are currently ECU 3.5 billion of UK Government Treasury bills outstanding. Secondary market turnover in this period averaged just over ECU 2 billion per month, unchanged from the levels of activity seen earlier in the year.

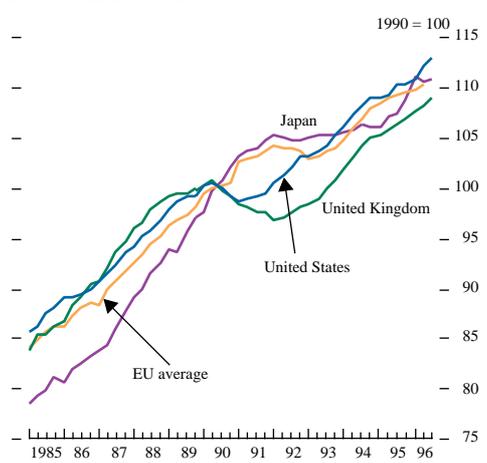
On 15 October, the Bank reopened the United Kingdom's ECU Treasury Note maturing in 1999 with a further tender for ECU 500 million, raising the amount outstanding with the public of this Note to ECU 2.0 billion. There was strong cover at the auction of over five times the amount on offer, and accepted bids were in a tight range of 4.38%–4.39%. The total of Notes outstanding with the public under the UK ECU Note programme thus rose from ECU 6.0 billion to ECU 6.5 billion.

The international environment

The main news since the previous Quarterly Bulletin is:

- The buoyant US economy slowed in the third quarter, mainly because of lower consumer spending, but picked up again in the fourth quarter.
- The slowdown in Europe may have troughed in mid-1996. GDP growth in Germany, France and Italy was quite strong in the third quarter, largely led by exports. But it was boosted by temporary, special factors and domestic demand remained weak.
- The slow recovery in Japan continued in the third quarter. There, too, the external sector has offset falls in domestic demand.
- Inflation remained low, reflecting the large output gaps in several continental European countries and in Japan. Inflation in the United States has been surprisingly low.
- Several European countries cut official interest rates in November and December. But in the G3 countries, interest rates were left unchanged in the fourth quarter. All major industrial countries plan to tighten fiscal policy in 1997.
- Ten-year government bond yields fell further over the fourth quarter as a whole, but started rising during December.
- Global trends in world growth and trade have been favourable, with a convergence of growth in most regions. In particular, growth seems to have stabilised at a sustainable level in the dynamic Asian economies, and increased in the transition economies of Central and Eastern Europe.

Chart 1
Real GDP levels



Overview

During the past four or five years, growth in the United States has been consistently strong, but it has been weaker and more volatile in Japan and Europe (see Chart 1). In the United States, the key issue is whether the economy has slowed towards its sustainable rate of growth or if the Q3 slowdown was temporary. In much of Europe and in Japan, the question is whether the fragile recoveries in 1996 will be sustained, particularly in view of fiscal contraction.

In the United States and Europe, the drag on growth caused by lower rates of stock accumulation may have ended in the second half of 1996, with positive implications for growth in 1997. The major economies benefited in the second half of 1996 from earlier reductions in short-term real interest rates, from better corporate profitability and from continued low inflation. The wider international picture also improved; the emerging market economies grew strongly on average last year, while fears of overheating in Asia lessened, and Latin America recovered from the Mexican crisis. Japan and most EU countries aim to tighten fiscal policy in 1997. While that should improve performance over the

Monetary policy in transition—the case of Central Europe

Maintaining the purchasing power of the currency, whether internally (price stability) or externally (exchange rate stability), is the formal final goal of monetary policy in all the central European transitional countries. But closer inspection suggests that this goal is pursued differently across countries. Although all have succeeded in reducing inflation since the early 1990s, the goal of low inflation appears to have been pursued most successfully in the Czech and Slovak Republics and Slovenia. By 1996, inflation in those countries had fallen to 10% per year or less. By contrast, inflation in Poland and Hungary has remained at 20%–30% per year. The Czech and Slovak Republics have pursued fixed nominal

exchange rates (within a corridor since early 1996), while Slovenia adopted a managed float. By contrast, the Hungarian and Polish currencies have been progressively devalued over the past three years by means of ‘crawling pegs’ in an attempt to limit real exchange rate appreciation. So inflation has been reduced to the lowest rates in countries which have not devalued their currencies to try to maintain competitiveness.

The final goal of price stability in Poland and—along with exchange rate stability—in Hungary, appear to be longer-term aims. Poland used strong measures to halt inflation at the beginning of the 1990s. But a gradualist approach is now being pursued because of concerns about short-run losses in trade competitiveness and output. In Hungary, too, there has been a short-run conflict between the pursuit of low inflation through high interest rates and a strong exchange rate, and the adverse consequences of these on the budget and trade deficits respectively.

Has the decline of inflation made a noticeable difference to the rate of economic growth?

The evidence from across the former Communist bloc is that a sustained recovery of real output has only occurred once inflation has been brought down to rates below about 50% per year.⁽¹⁾ Relatively low and stable inflation appears to have been an important precondition for the strong output growth of the past few years in Central Europe; and high and/or volatile inflation may explain why output is still falling in most of the former Soviet Union. However—as shown in the table—a comparison of the central European economies shows no simple relationship, positive or negative, between inflation and output growth in recent years. In Poland, GDP growth

Price inflation, exchange rate depreciation and real GDP growth 1993 Q2–96 Q2

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia	
	Fixed band		Crawling band (a)		Crawling band		Fixed band		Managed float	
Exchange rate system	Fixed band		Crawling band (a)		Crawling band		Fixed band		Managed float	
Depreciation of domestic currency (%) (b)	-3.8		41.4		36.7		6.1		20.5	
Increase in consumer prices (%) (c)	30.7	8.5	91.2	24.0	109.7	20.9	34.0	6.1	51.5	10.8
Increase in consumer prices, US dollar terms (%)	35.7		12.0		32.7		25.9		20.4	
Increase in real GDP (%) (d)	13.1		5.7		19.1		20.0		11.8	
Increase in foreign currency reserves (US dollar billions) (e)	10.3	12.5	5.0	9.9	14.2	17.5	3.1	3.3	1.0	1.7

Data source: IMF, International Financial Statistics.

- (a) Adjustable peg pre-March 1995.
 (b) Against US dollar; - means appreciation.
 (c) Figures in *italics* show price inflation in the year to 1996 Q2.
 (d) Between 1993–96, IMF estimates.
 (e) Foreign currency reserves excluding gold; figures in parentheses show the stocks outstanding in 1996 Q2.

(1) See, for example, S Fischer, R Sahey and C Vegh (1996), ‘Stabilisation and growth in transition economies: the early experience’, *Journal of Economic Perspectives*, Volume 10.

medium term by reducing long-term real interest rates, it is not clear to what extent there may be negative effects on demand in the short term. These may be more likely as many countries are pursuing fiscal retrenchment at the same time. The outlook depends on the effects of fiscal policy retrenchment and the response of monetary policy.

Growth in the major six (M6) overseas economies was 0.7% in the third quarter.⁽¹⁾ But that probably overstates underlying activity because growth in France and Italy was boosted by temporary special factors. These have unwound in the fourth quarter, lowering growth in these two countries. In Germany, fourth quarter GDP will have been depressed by the effect of the cold weather on construction.

(1) GDP growth in the United States, Japan, Germany, France, Italy and Canada weighted by trade shares with the United Kingdom.

has been among the highest in the region, but so has the rate of inflation. On the other hand, Slovakia has reduced inflation to the lowest rate in the region (6% per year by mid-1996) while output growth is the fastest. Lower inflation is still likely to be an important factor in stimulating longer-term economic growth but, for such relatively small cross-country differences in inflation rates, it is probably less important than differences in the speed of structural reform, the scale of the previous decline in output and the initial economic conditions at the outset of reform (eg government and external debts).

Exchange rate stability versus price stability?

The balance of payments has been a key concern of monetary and economic policy in the region in recent years. In 1994 and 1995, the concern was that overall external surpluses were too large, resulting in too much monetary growth. According to the latest official data, these large surpluses were attributable mainly to massive private capital inflows into the Czech Republic and Hungary and strong net export growth in Poland and Slovakia. All these countries adjusted their fixed exchange rates regimes to reduce short-term speculative capital inflows. Hungary widened its intervention band from +/- 1.25% to +/- 2.5% in December 1994, while Poland went further by widening its crawling band in two steps in the first half of 1995 from +/- 0.5% to +/- 7% and undertaking a 6% revaluation of the zloty at the end of 1995. Although the Czech and Slovak Republics maintained their fixed central rates, they also introduced exchange rate corridors, of +/- 7.5% and +/- 5% respectively, in 1996. This added flexibility was successful in deterring further speculative inflows.

By 1996, large external surpluses had given way to falling current account positions (except in Hungary). That has raised questions about the appropriate level of nominal exchange rates and whether devaluation was

asked for. Measures of competitiveness in most countries, however, suggest that real exchange rates are still below equilibrium levels. Moreover, actual real exchange rates may need to appreciate if equilibrium real rates are appreciating as a result of fast improvements in regional productivity.⁽²⁾

One explanation for the recent deterioration in current accounts in the Czech Republic, Poland, Slovakia and Slovenia is the sharp upturn in domestic spending—fuelled in some countries by earlier sizable capital inflows—combined with a general slowdown in spending in Western Europe and capacity constraints in domestic production. In addition, current account deficits in transition countries can be viewed partly as the expected counterpart to capital inflows from abroad to help finance investment and economic growth.

Fixed exchange rate systems have helped many transitional countries, including the Czech and Slovak Republics, reduce inflation to modest rates. However, it may prove difficult to reduce inflation to Western European rates in the near future unless exchange rate appreciation is permitted. A fixed nominal exchange rate may result in the convergence of price inflation in the tradable sector on Western European rates but non-tradables, including most services, do not face the same competitive pressures.

Strong productivity growth in manufacturing—the main tradables in transitional countries—permits large real wage increases in the tradable sector without necessarily leading to large price increases (above those in Western Europe). But if real wages rise as fast in the non-tradable sector, where productivity growth is lower, prices in that sector—and consumer prices in aggregate—will increase more quickly than in the EU.⁽³⁾ This suggests that the final monetary policy goals of price and exchange rate stability are not always compatible.

(2) See L Halpern and C Wyplosz 'Equilibrium exchange rates in transition economies', *IMF Working Paper 96/125*, November 1996.

(3) The Balassa-Samuelson effect.

Table A
Contributions to US GDP growth^(a)

Quarter-on-quarter contributions

	1995	1996		
	Q4	Q1	Q2	Q3
Domestic demand	-0.2	0.8	1.3	0.8
Stockbuilding	-0.3	-0.3	0.1	0.4
Investment	0.1	0.4	0.3	0.4
Government	-0.1	0.0	0.3	0.0
Consumption	0.2	0.6	0.6	0.1
Net trade	0.2	-0.3	-0.2	-0.3
GDP	0.1	0.5	1.1	0.5

(a) Contributions may not sum due to rounding.

Growth in the United States slowed in the third quarter, but probably picked up in the fourth

In the United States, GDP grew by 0.5% in the third quarter, a slowdown from the strong growth in the second quarter (see Table A). That was mainly attributable to a slowdown in consumption growth, particularly of durable goods, which was unexpected and hard to explain. Recent indications suggest that consumption rebounded in the fourth quarter: retail sales were strong in October and November and industrial production rose in November. Consumer confidence was high, and large capital gains accrued on equities. Housing starts also rose strongly in November, and mortgage applications for new home purchases rose sharply. Employment data for December were strong, leaving the unemployment rate at 5.3%. Though the data

Chart 2
GDP growth in Germany, France
and Italy

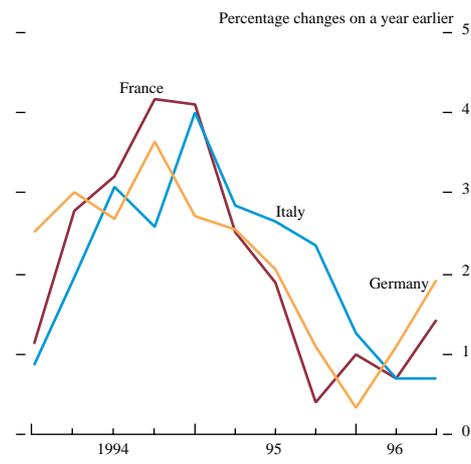


Table B
Contributions to German GDP growth^(a)

Quarter-on-quarter contributions

	1995	1996		
	Q4	Q1	Q2	Q3
Domestic demand	0.2	-0.4	1.2	0.0
Stockbuilding	0.3	0.3	-0.9	-0.5
Investment	-0.2	-1.2	1.5	0.1
Government	0.1	0.1	0.2	0.2
Consumption	-0.1	0.4	0.3	0.1
Net trade	-0.1	0.0	0.3	0.8
GDP	0.1	-0.4	1.5	0.8

(a) Contributions may not sum due to rounding.

Table C
Contributions to French GDP growth^(a)

Quarter-on-quarter contributions

	1995	1996		
	Q4	Q1	Q2	Q3
Domestic demand	-0.9	0.6	0.3	0.6
Stockbuilding	-0.7	-0.8	0.7	-0.3
Investment	-0.1	-0.2	0.0	0.2
Government	0.1	0.1	0.1	0.1
Consumption	-0.2	1.5	-0.5	0.6
Net trade	0.4	0.6	-0.4	0.3
GDP	-0.5	1.1	-0.2	0.9

(a) Contributions may not sum due to rounding.

Table D
Contributions to Italian GDP growth^(a)

Quarter-on-quarter contributions

	1995	1996		
	Q4	Q1	Q2	Q3
Domestic demand	0.7	0.1	-1.5	0.3
Stockbuilding	0.6	0.1	-1.6	0.2
Investment	0.3	-0.1	0.0	0.0
Government	-0.1	0.0	0.0	0.0
Consumption	-0.1	0.1	0.1	0.1
Net trade	-0.6	0.4	1.1	0.3
GDP	0.0	0.5	-0.4	0.6

(a) Contributions may not sum due to rounding.

are mixed, overall they suggest that the US economy slowed towards trend growth in the second half of 1996, but that activity was higher in the fourth quarter than in the third.

One indicator that underlying growth in the United States has remained quite strong is the big gap between the different measures of GDP—GDP(0) the official output measure, and GDP(I) the income measure of GDP. In the third quarter, GDP(I) rose by 4.1% on the previous year, compared with 2.0% for GDP(0). Tax revenues were more buoyant than expected, adding support to the impression of high income growth. So the official data may be understating growth.

Net exports led a revival in Germany and France in the third quarter

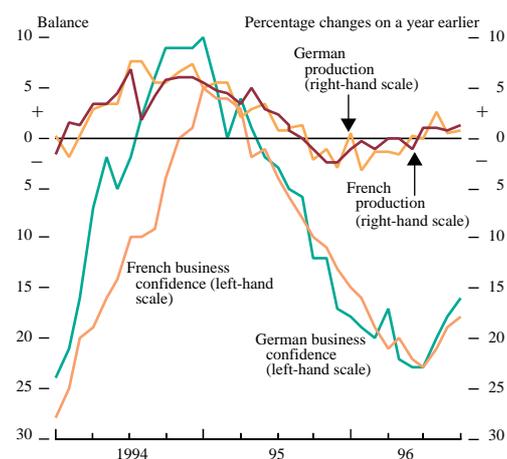
Data for the third quarter of 1996 suggested that growth picked up in the larger continental European economies (see Chart 2). GDP grew by 0.8% in Germany, by 0.9% in France and by 0.6% in Italy. The increase was driven by net exports, particularly in Germany where they contributed 0.8 percentage points to growth in the third quarter (see Table B). That was the first positive contribution from net exports in Germany since 1993 Q1. Domestic demand, by contrast, remained weak. Private consumption, business investment and government spending were all subdued.

GDP growth in France and Italy was sustained by consumer spending in the third quarter, and, to a lesser extent, by investment and net trade (see Tables C and D). But some of the growth reflected special factors which unwound in the fourth quarter. In France, a significant part of the increase in consumption in the third quarter reflected the effects of the car incentive scheme which brought forward sales into the third quarter. The monthly measure of household consumption fell by 2.6% in October, after the scheme had ended. In both France and Italy, third quarter GDP was also boosted by a higher-than-usual number of working days. The seasonal adjustment processes in these countries do not take account of this effect. INSEE, the French statistical body, have estimated that extra working days added 0.25% to GDP in the third quarter. Over much of 1996, consumption in these two countries was sustained by a fall in the saving ratio. A reversal of this fall is a downside risk to activity during 1997.

The growth of industrial production slowed down in Germany during the fourth quarter; in France industrial production fell in both September and October. And the Italian economy was weakest of all. Forward-looking indicators, however, suggest that the recovery in the major European Union (EU) economies will continue. As Chart 3 shows, industrial confidence rose steadily from its mid-year trough in Germany and France, as it did in most EU countries, and there was a marked rise in November. But, the consumer sector was weaker (see Chart 4). Consumer confidence barely picked up at all in the EU in the second half of 1996, and indeed fell in Italy.

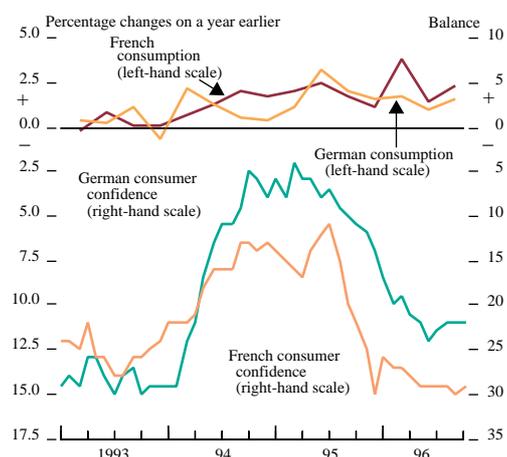
Labour market conditions continue to have an adverse effect on consumer spending and domestic demand in the European economy. Unemployment in the EU rose further in the third quarter of 1996, to an average 11.2% in October. In Germany, unemployment (pan-German, seasonally adjusted) rose by about 50,000 in each of the four months September–December 1996. German

Chart 3
Industrial confidence and production



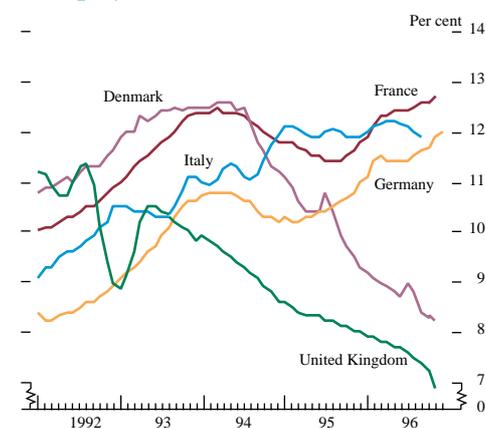
Source of survey: European Commission.

Chart 4
Consumer confidence and consumption



Source of survey: European Commission.

Chart 5
Unemployment



unemployment in December was 4.2 million, or 10.9% of the workforce. In France, unemployment rose to 12.7% in November, continuing on an upward trend. In Italy, unemployment is measured quarterly and rose from 11.7% to 12.2% between July and October last year, confirming the slowdown in the economy (see Chart 5).

The continued weakness in the labour market and the tighter fiscal stance in 1997 are likely to dampen the recovery in the largest continental European economies. It is unlikely that GDP in these countries will grow much above trend, despite the existence of spare capacity and the favourable impetus from low interest rates, strong corporate profitability and the generally weaker Deutsche Mark. And the recovery will depend on the extent to which the rise in net exports feeds through into investment and employment.

The smaller continental EU economies performed better on average last year

Outside the largest three continental European economies, EU growth in the second half of 1996 was more broadly based, although net exports underpinned activity in most countries. Austria, Belgium and the Netherlands, whose currencies are closely linked to the Deutsche Mark, benefited from increased export competitiveness in the second half of 1996. Business fixed investment rose markedly in Belgium and Ireland. Labour market flexibility and/or the introduction of new measures to increase flexibility seems to have led to falling unemployment in Ireland, the Netherlands and Denmark during 1996—this has underpinned household spending. Domestic demand was also strong in Finland, Spain and Portugal in the second half of 1996.

The weak recovery in Japan continued

Japanese third quarter GDP data confirmed the view that the recovery was weak (see Table E). GDP rose by 0.1% in the quarter, to a level 3.5% higher than a year earlier. Estimates of earlier growth were revised upwards; GDP growth in 1995 is now estimated at 1.3% rather than 0.8%. Domestic demand was extremely weak in the third quarter of 1996, falling for the second quarter in succession. Consumer spending fell, partly because of temporary factors such as the bacteria food poisoning scare and the unusually mild summer. Consumption is likely to have picked up in the fourth quarter, as these effects unwound. Household expenditure rose in November for the first time since June. The strength of net trade in the third quarter probably reflected the improved competitive position of the large manufacturing companies resulting from the weaker yen. Recent Tankan surveys have suggested that they are more optimistic than smaller companies. In particular, the survey showed that small firms remained cautious over the investment outlook. Capital investment has been an important factor maintaining the weak recovery so far. Business investment grew by 5.7% in fiscal year 1995 and by an annualised 5.3% in the first half of fiscal year 1996.

The wider international picture is brighter

There is some evidence of synchronised growth in all the main trading areas. As noted above, the large EU economies experienced lower growth in 1996 than the other large industrialised countries, but showed some signs of a recovery. Growth in Central and

Table E
Contributions to Japanese GDP growth^(a)

Quarter-on-quarter contributions

	1995	1996		
	Q4	Q1	Q2	Q3
Domestic demand	1.8	2.4	-0.1	-0.2
Stockbuilding	0.1	0.1	-0.2	-0.2
Investment	1.1	1.0	0.7	0.1
Government	0.0	0.1	0.0	0.1
Consumption	0.6	1.2	-0.6	-0.1
Net trade	-0.4	-0.3	-0.2	0.3
GDP	1.3	2.0	-0.3	0.1

(a) Contributions may not sum due to rounding.

Chart 6
Consumer prices

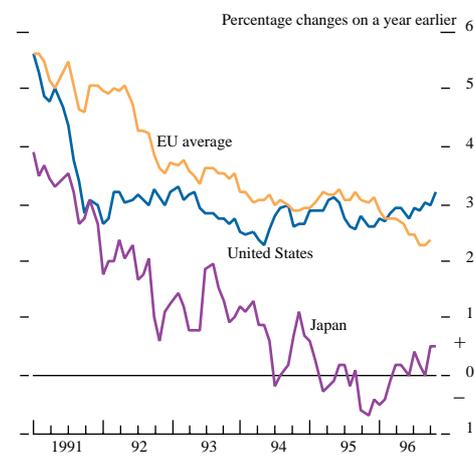
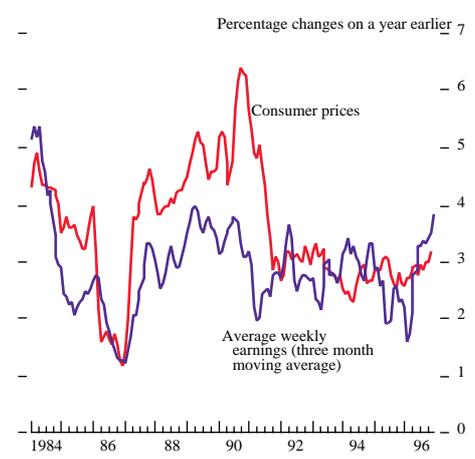


Chart 7
United States consumer prices and average weekly earnings



Eastern European economies, which are important export markets for Germany, firmed significantly last year, following sharp contractions in the early 1990s. Among other developing countries, there was a pick-up in Latin America (notably Mexico and Argentina) and Africa in 1996. Growth in the dynamic Asian economies slowed in the first half of 1996, reflecting tighter monetary policies. Their exports in 1996 were affected by some loss of competitiveness as currencies appreciated against the yen, and by rising unit labour costs and a fall in demand for computer-related products. But there seems to have been some recovery in the second half of the year, to a rate of growth slightly lower than in earlier years, but one which may be more sustainable over the medium term.

Inflation remains low

The trend towards lower inflation has been a worldwide phenomenon. The IMF estimated in its October *World Economic Outlook* (WEO) that average consumer price inflation fell between 1995 and 1996 from 19.8% to 13.3% in developing countries, and from 12.8% to 4.1% in transition countries. Those falls are in spite of higher oil and food prices. The IMF concluded that 'a large part of the recent decline in inflation can be attributed to the adoption of sustained non-inflationary policies'.

Recent news on inflation in the major industrialised countries continued to be good, as Chart 6 shows. In December, annual consumer price inflation was 1.4% and 1.7% in Germany and France respectively, and 2.5% in Italy. The downward trend continued in Spain, where annual consumer price inflation fell to 3.2%. In the EU as a whole, consumer price inflation fell to 2.2% per year in November, its lowest rate since compilation of the figure began in 1983. Six countries had inflation rates below 2%; the lowest was Sweden where prices were 0.3% lower than a year earlier. Measured consumer price inflation in Japan remained negligible, at about ½% per year. In the United States, inflation has remained surprisingly low, given the likely absence of an output gap, and the decline in unemployment towards its 'natural rate'.

Among the industrialised countries, upside risks to inflation are most evident in those countries estimated to have small (or no) output gaps. In the United States, consumer price inflation rose from 3.0% in September to 3.3% in December, partly reflecting higher oil prices. That compares with consumer price inflation of 2.5% in 1995. And rising average hourly earnings (up to an annual rate of 3.8% in December) may put further upward pressure on US inflation (see Chart 7). But core inflation (excluding energy and food) remained at around 2.6%, lower than the 3% rise recorded in 1995. Output gaps are expected to narrow in several EU countries during 1997, notably in the Netherlands and Denmark, which may result in some upward pressure on inflation. But inflation is very low in these countries.

Interest rates

Official interest rates were unchanged in the G3 countries in 1996 Q4, but were cut in Canada, France, Italy and a number of other European countries. Both German and US short-term interest rate expectations were revised down in the fourth quarter on signs of continued weak growth in Germany, and the FOMC decision in September 1996 to leave US interest rates unchanged.

Table F
Real interest rates^(a)

Per cent per year

	Mid-Nov.	Mid-Dec.	Mid-Jan.
United States	2.68	2.65	2.71
Germany	1.35	1.16	1.33
France	1.69	1.57	1.45
Italy	4.21	4.10	3.90
Japan	-0.65	-1.00	-1.14
Canada	1.68	2.04	1.64

(a) Based on one year nominal euro currency rates and inflation expectations expressed in Consensus Forecasts Inc.

Table G
Ten-year interest rate differentials

As at 2 January 1997

	Spot yield	Forward rate
UK-US	1.13	0.96
UK-Japan	4.79	3.73
UK-Germany	1.37	0.04
UK-France	2.13	0.93
UK-Canada	0.97	0.14
UK-Italy	0.05	-0.94

Chart 8
Average narrow money and nominal GDP growth in the G7

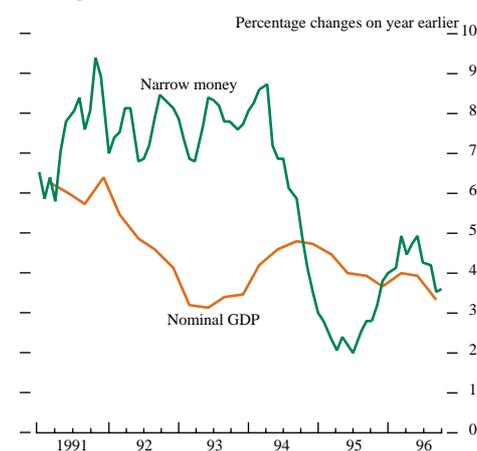


Table F shows movements in real interest rates in the M6 economies. Real interest rates became more negative in Japan between November and January, as inflation expectations firmed. Real rates fell a little in France and Italy, but were largely unchanged in the United States and Germany.

Ten-year bond yields fell over the fourth quarter as a whole (see Chart 12 in the article on the operation of monetary policy on page 13). US yields fell by 28 basis points, but were 83 basis points higher than at the start of 1996. Towards the end of the fourth quarter, bond yields in the United States began to rise, in part reflecting strong mortgage demand, and this was accompanied by increases elsewhere.

European bond yields continued to be influenced by sentiment towards EMU. Bonds yields declined over the quarter as a whole, and the convergence of European yields continued. In particular, the spread of Italian and Spanish government bond yields over German government bond yields continued to narrow as the prospects for a wider EMU were seen to improve. The lira resumed its full participation in the exchange rate mechanism (ERM) on 25 November. The Stability Pact agreed in Dublin in December was also regarded as improving the chances of a wider EMU.

Ten-year yields on Italian bonds fell below equivalent UK bond yields on several occasions in November and December. But it is misleading to look at ten-year spot rates alone. This is because the difference between bond yields for two countries at a particular maturity largely reflects the difference in the expected path of short-term interest rates for the two countries up and until the maturity date. (Other contributory factors include differences in risk premia and market liquidity.) A large difference in the expected path of short-term interest rates in the *near term* may account for a large proportion of the difference in long-term bond yields between the two countries. Table G compares zero coupon spot rates with ten-year forward rates. While the spot yield differential at ten years between Italy and the United Kingdom is negligible, Italian ten-year forward rates were more than 90 basis points higher than UK rates at the start of the year.

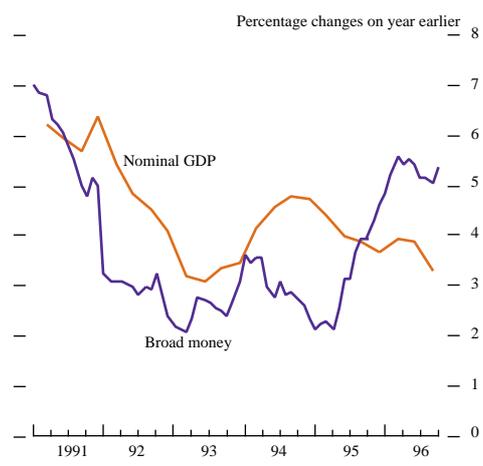
The table also shows that, comparing UK and German yields, the ten-year forward-rate differential is only a few basis points. So almost all of the difference in spot ten-year yields can notionally be attributed to differences in expected short-term nominal interest rates.

Narrow money

In 1996 Q3, the weighted average of annual narrow money growth (M1) in the G7 countries fell significantly to 3.5%, from its previous peak of 5.0% recorded in each of the first two quarters of the year (see Chart 8). Figures for the fourth quarter so far suggest that narrow money growth increased again in at least half the G7 countries.

Narrow money growth was substantially higher than nominal GDP growth during the early 1990s, and grew more slowly during 1995. But during 1996 nominal GDP and narrow money were growing at similar rates. The weighted average of nominal GDP growth in the G7 fell slightly to about 3.2% in the third quarter, its lowest since early 1993.

Chart 9
Average broad money and nominal GDP growth in the G7



As usual, there were significant differences among G7 countries. Annual M1 growth in the United States became even more negative over the reporting period. Indeed, excluding the United States, average annual narrow money growth in the remaining six countries was around 8.9% in the third quarter. Japan still had the highest narrow money growth rate in the G7 in the third quarter, although growth fell sharply between the second quarter and November. German M1 growth was slightly more subdued in the third quarter than in the second and fell to 10.0% in November.

Broad money

The weighted average of annual broad money growth in the G7 economies was 5.1% in 1996 Q3 compared with 5.4% in the second quarter (see Chart 9). In October 1996, the average annual growth rate returned to 5.4%, broadly in line with growth over the previous year. Average broad money growth in the G7 led average nominal GDP growth by about a year in the first half of the 1990s, but, since end-1995, the lead time seems to have shortened. But it is too early to draw any firm conclusions about this. In Germany, broad money growth in 1996, at 7.9%, exceeded its target range of 4%–7%.

Both the Bundesbank and the Bank of France announced new money supply targets for 1997. The Bundesbank set the target corridor for M3 growth between 1996 Q4 and 1997 Q4 at 3.5%–6.5%. It also extended its target horizon for M3 from one to two years, indicating that the special circumstances of the run up to Stage 3 of EMU, and increased volatility in the monetary aggregate, resulting from international financial markets, required it to place greater emphasis on the medium-term operation of monetary policy. An annual rate of growth of around 5% over 1997 and 1998 is considered appropriate to ensure price stability.

The Monetary Policy Council of the Bank of France announced that it will simultaneously monitor the main narrow and broad money aggregates. The broad money reference aggregate has been amended to take account of various savings schemes.

The Italian authorities announced an inflation target of 2.5% for 1997, and 2% for the following two years. The Bank of Spain announced a medium-term policy objective of achieving inflation close to 2% during 1998. Broad money growth not exceeding 7% will be regarded as acceptable from 1997.

Fiscal policy

Tighter fiscal policy is planned in Japan and the EU

At the end of 1996, the Japanese government put forward a supplementary package for fiscal year 1996/97 and announced the Budget for the following fiscal year. The former offered a further small stimulus worth ¥3.6 trillion which should occur in the second quarter of 1997. But fiscal policy will nevertheless be contractionary in fiscal year 1997/98 by around 1% of GDP after allowing for increased expenditure.

As reported in the previous *Quarterly Bulletin* virtually all EU countries introduced 1997 budgets aimed at achieving a fiscal deficit/GDP ratio of 3% or less, in accordance with the Maastricht convergence criterion reference value.

The diagrams in the box on page 30–31 show the performance of EU countries against the four quantitative convergence criteria during 1996. The data for inflation and interest rates refer to the twelve-month period to September 1996. The data for the ratios of the government deficit and general government debt to GDP are the EC forecasts for 1996. Provisional estimates for outturns in 1996 available from Germany and France are broadly in line with these forecasts.

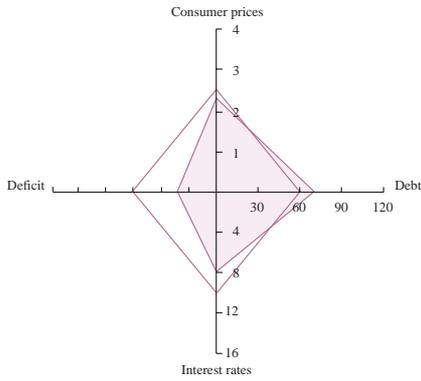
Preliminary estimates from the German Finance Ministry showed that the general government deficit in Germany rose in 1996 by DM 15 billion to DM 138 billion, or 3.9% of GDP (3.5% in 1995). A fall in tax revenues accounted for most of the overshoot. The ratio of government debt to GDP rose to 60.3%.

In France, the cumulative budget deficit at the end of November was nearly Ffr 330 billion, compared with the target of Ffr 288 billion. Net fiscal receipts were marginally lower than forecast; expenditure was higher. The French government was confident that the target for the year as a whole would be met, because of financial flows in December.

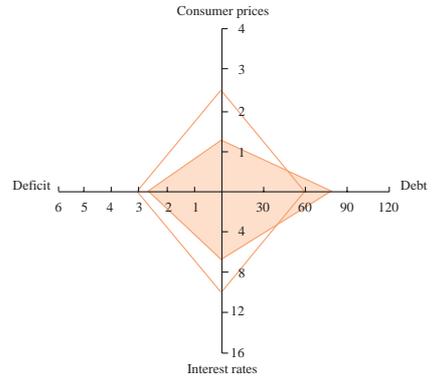
Preliminary figures from the Italian Treasury in January revealed a substantial overshooting of the target for the State Sector Borrowing Requirement (SSBR) in 1996. The SSBR was 7.4% of GDP in 1996, according to preliminary figures, compared with 7.3% in 1995 and a target of 6.6% set in September 1996. Official estimates for the outturn had been revised up during the year, as the GDP growth turned out lower than expected. The general government deficit in 1996 may be slightly less than the SSBR, because of differences in national and EU accounting standards.

Recent performance relative to Maastricht convergence criteria

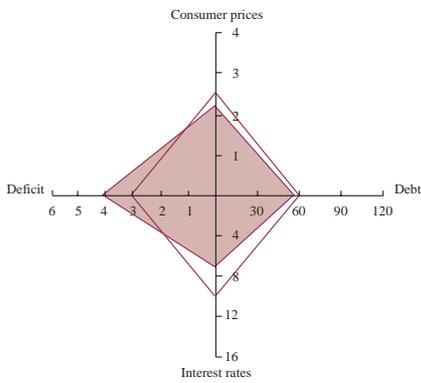
Denmark



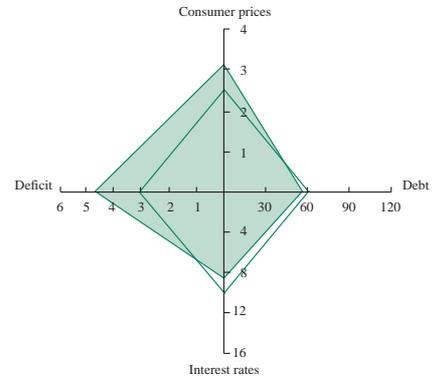
The Netherlands



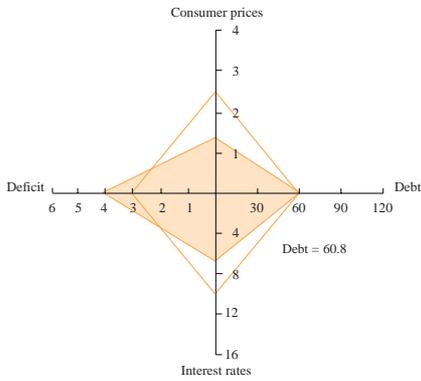
France



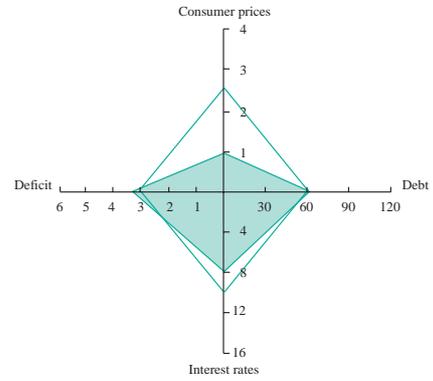
United Kingdom



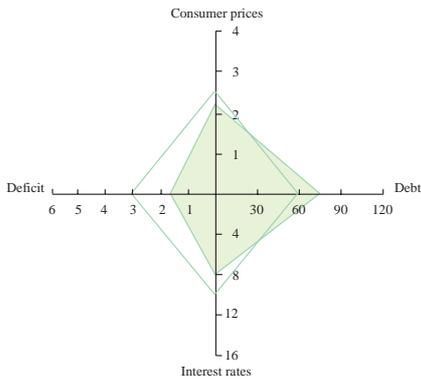
Germany



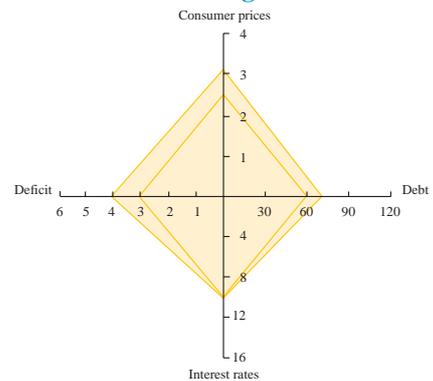
Finland

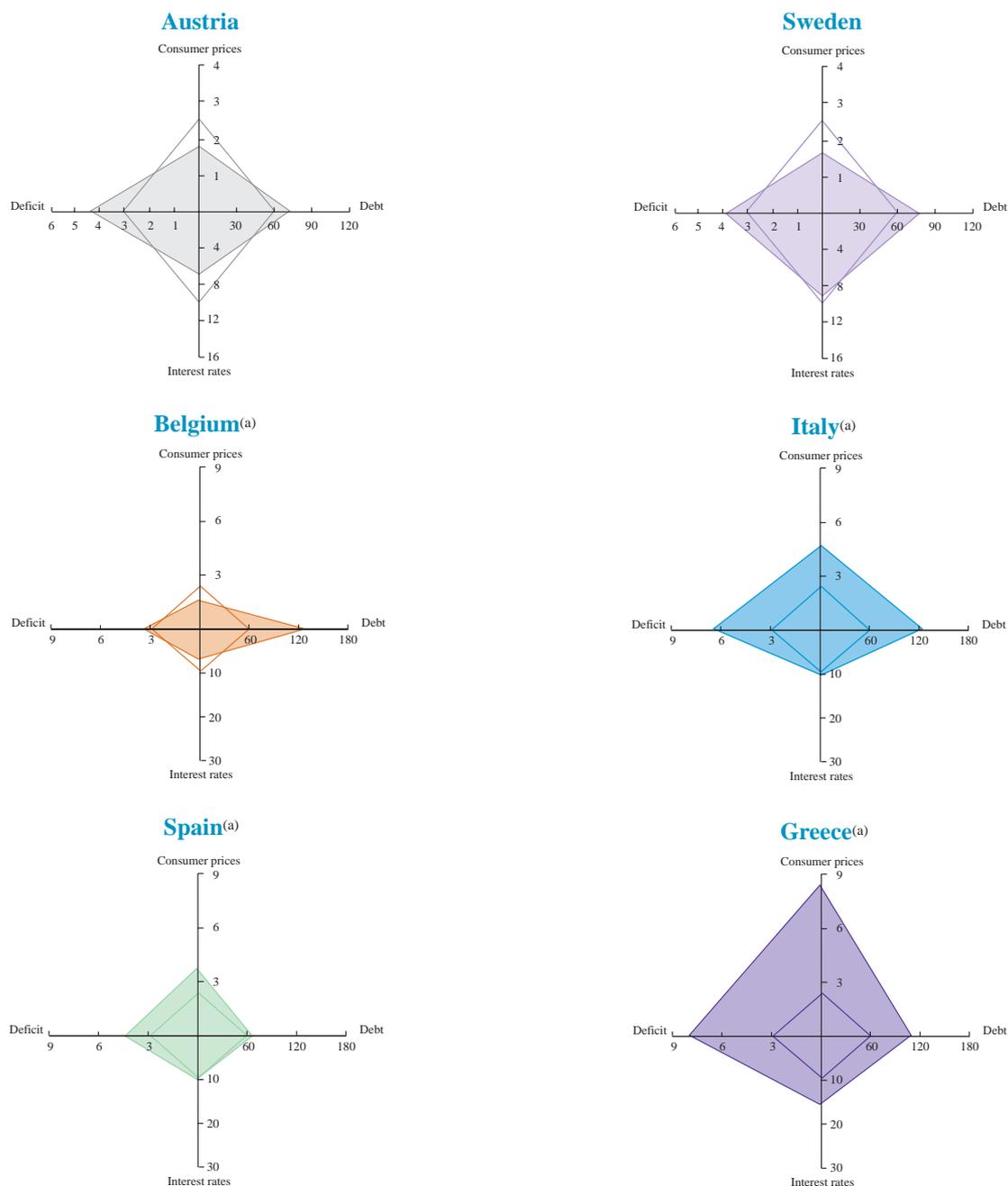


Ireland



Portugal





Source: Eurostat data and national country.

(a) A different scale is used for these four countries.

The diagrams show the recent performance of EU countries against the convergence criteria for fiscal deficit and debt, inflation, and long-term interest rates. The shaded 'kite' shows the country's performance, while the other 'kite' shows the reference points for each criterion.

- The measure of inflation is the interim harmonised measure of consumer prices. The diagrams show the increase in the indices in the twelve months to September 1996. The reference value for the convergence criterion is 1.5 percentage points above the three best performing countries.
- The interest data are average long-term government bond yields for the twelve months to September 1996. The reference value is 2 percentage points above the three best performing countries in terms of inflation.
- The deficit and debt are expressed as a percent of GDP and are European Commission autumn estimates for 1996, and are in line with Maastricht Treaty definitions. The reference values are 3% of GDP for the deficit and 60% of GDP for the debt.

Financial market developments⁽¹⁾

- *Equity and bond issuance levels were high in most major markets in 1996.*
- *Equity prices rose strongly in the United States and Europe over the year.*
- *Speculation over the timing of, and participants in, the planned European Monetary Union continued to be an important influence on bond, equity and derivatives markets.*

Background

The fourth quarter completed a buoyant 1996 for most bond, equity and derivatives markets. This was reflected in a high level of new issues in the bond and equity markets and growing turnover volumes on exchanges.

Continuing the trend of earlier months, most European government bond yields continued to fall during the fourth quarter. One of the major features of the quarter was the fall in Italian government bond yields in anticipation of, and following, the return of the lira to the exchange rate mechanism on 25 November. Italian government bond yields fell towards those of Germany; and on several days in November and December, yields on Italian ten-year government bonds fell slightly below those of UK ten-year government bonds. The fall in Italian bond yields could reflect a decline in longer-term inflation expectations and also the cyclical slowdown in the Italian economy. These explanations are discussed in the article ‘Recent yield curve behaviour—an analysis’ on pages 43–8.

US and European equity prices rose throughout the year, held back only briefly in the summer by concerns that stronger economic growth in the United States might be accompanied by a tightening of monetary policy. As prices continued to rise in the US equity market, there was some comment on whether the market might be overvalued. But the higher equity valuations have been sustained: the fourth quarter was strong in both the United States and continental Europe, though equity prices in the United Kingdom rose less strongly. Turnover volumes, too, were strong in those markets. Activity in Japanese equities, by contrast, was sluggish and prices fell over the year.

There were a number of important structural developments during the year.

- CREST, the United Kingdom’s new electronic book entry equity settlement system which is replacing Talisman, began operations in July and, by April 1997,

all UK equities should be settled using the new system.

- In August, the London Stock Exchange introduced Sequence 6, a development to its trading platform which enables electronic trade reporting and increases access to its SEATS PLUS automated order book for less liquid shares. A further development to the trading system is planned for late 1997, involving the replacement of the existing market-making system with an electronic order book for the most liquid shares; shares outside the top 100 will continue to be traded using market-makers.
- A new pan-European market for the trading of the shares of small to medium-sized companies, EASDAQ, opened in October and was trading the shares of four companies by the end of 1996.
- The London Commodities Exchange (LCE) merged with LIFFE in September.
- The ownership of the London Clearing House—which clears for most of London’s derivatives exchanges—was transferred from its six share-holder banks to the exchanges and its clearing members in October.

Bonds

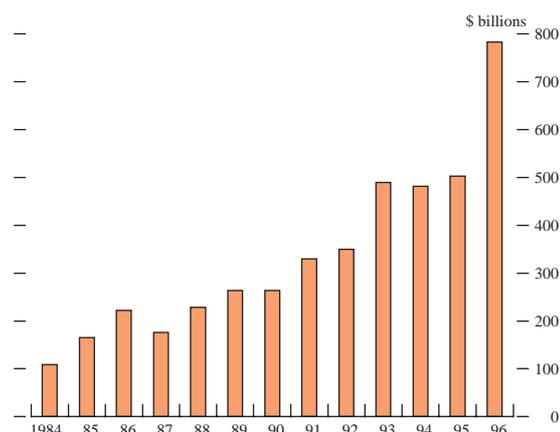
International issues

Gross issuance of international bonds was at record levels—\$783 billion—in 1996, a 56% increase in issuance on 1995. However, redemptions in 1996 were also much higher than in 1995 and refinancing of redeemed debt partly accounts for this high gross issuance. A key influence on issuance in 1996 was favourable macroeconomic conditions.

Issuance was particularly high in the first quarter of 1996, 78% up on the first quarter of 1995. It remained high for the rest of the year, with the fourth quarter 60% higher than

(1) We propose to discontinue quarterly publication of this review article. Relevant markets developments will continue to be reported in the *the operation of monetary policy and the international environment*, and we intend also to address important structural issues in special *Bulletin* articles from time to time. We would welcome feedback from readers about this proposal. Any correspondence should be addressed to the Publications Editor, Monetary Analysis, Bank of England, Threadneedle Street, London, EC2R 8AH.

Chart 1
Gross international bond issuance



Sources: Bank of England ICMS database and IFR Omnibase.

Table A
Total financing activity:^(a) international markets by sector

\$ billions; by announcement date

	1995		1996				
	Year	Q4	Year	Q1	Q2	Q3	Q4
International bond issues							
Straights	378.4	97.7	548.9	147.9	130.4	126.5	144.1
Equity-related	24.1	5.8	52.3	14.7	15.1	10.6	11.8
of which:							
Warrants	6.7	3.2	11.7	4.2	3.6	2.6	1.3
Convertible	17.4	2.6	40.6	10.5	11.5	8.0	10.5
Floating-rate notes	100.1	25.2	181.8	38.7	46.4	46.1	50.5
Total	502.6	128.7	782.9	201.4	191.9	183.3	206.4
Credit facilities (announcements)							
Euronote facilities	293.3	70.9	364.0	101.1	95.2	65.6	102.1
of which:							
CP (b)	50.3	18.6	72.2	23.3	30.6	16.9	1.4
MTNs	243.0	52.3	291.8	77.8	64.6	48.7	100.7
Syndicated credits	785.0	220.1	792.3	171.9	232.5	191.4	196.5
Total	1,078.3	291.0	1,156.3	273.0	327.7	257.0	298.6
Memo: amounts outstanding							
All international							
Bonds (c)	2,224.9	2,224.9	2,365.6	2,230.4	2,251.0	2,305.1	2,365.6
Euronotes (b)	595.2	595.2	829.3	647.5	710.9	758.2	829.3
of which, EMTNs	461.0	461.0	664.0	504.6	555.0	607.2	664.0

Source: IFR, Euroclear, BIS.

(a) Maturities of one year and over. The table includes euro and foreign issues and publicised placements. Issues which repackaged existing bond issues are not included. Figures may not add to totals because of rounding. Bond total includes issues from MTN programmes.

(b) Euroclear figures.

(c) BIS-adjusted figures, including currency adjustment. Includes issues of fixed-rate bonds and floating-rate notes.

the fourth quarter of 1995. The increase was reflected across all sectors of the economy. The average maturity of international bonds issued in 1996 was eight years, with five years the most frequent maturity issued.

Table B
Industry classifications of international bond issues

Industry	1995		1996				
	Year	Q4	Year	Q1	Q2	Q3	Q4
Banks	36.8	32.9	38.0	39.9	38.2	37.7	36.2
International and commercial companies	29.0	33.3	30.7	27.4	33.0	27.1	35.1
Central governments	12.0	10.2	10.7	11.1	9.4	14.8	7.9
International agencies	7.7	7.1	7.7	8.2	6.4	7.2	9.0
Other	14.5	16.3	12.9	13.4	13.0	13.2	11.8
Total (US \$ billions)	502.6	128.7	782.9	201.4	191.9	183.3	206.4

Source: IFR Omnibase.

Table C
Currency composition of international bond issues

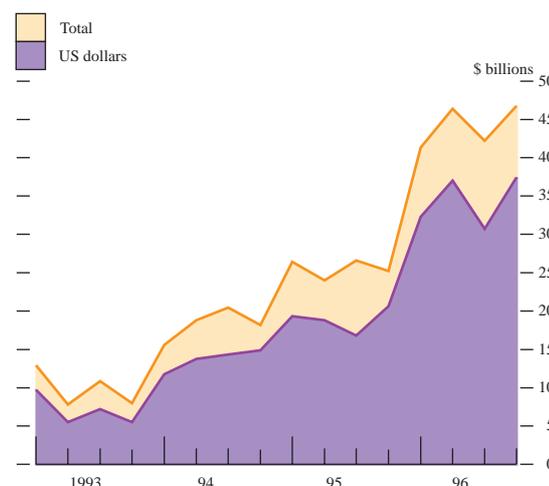
Currency denomination	1995		1996				
	Year	Q4	Year	Q1	Q2	Q3	Q4
US dollar	39.2	42.1	46.2	40.4	49.4	47.4	47.9
Yen	18.4	17.2	13.4	11.9	13.4	15.7	12.8
Deutsche Mark	13.9	15.0	10.6	15.9	8.8	10.6	7.1
Sterling	4.3	4.3	6.8	7.4	5.8	4.4	9.4
French franc	2.7	2.3	5.4	5.6	6.1	4.3	5.6
Swiss franc	6.1	5.3	3.3	4.3	3.2	4.0	1.8
Italian lira	2.4	1.7	4.6	2.8	4.2	3.3	8.0
Ecu	1.8	0.2	0.6	0.8	0.2	0.9	0.5
Other	11.2	12.1	8.9	10.8	8.9	9.2	6.7
Total (US \$ billions)	482.0	502.6	782.9	201.4	191.9	183.3	206.4

Source: IFR Omnibase.

The proportions of new issues denominated in the yen and Deutsche Mark in the international bond market fell in 1996, with sterling and US dollar issues taking a greater share of the market.

The increase in international issuance denominated in US dollars reflected a pick-up in issues by US-domiciled corporates of 72% between 1995 and 1996, continuing the rapid growth of this market over the past four years.

Chart 2
International bond issuance by US companies



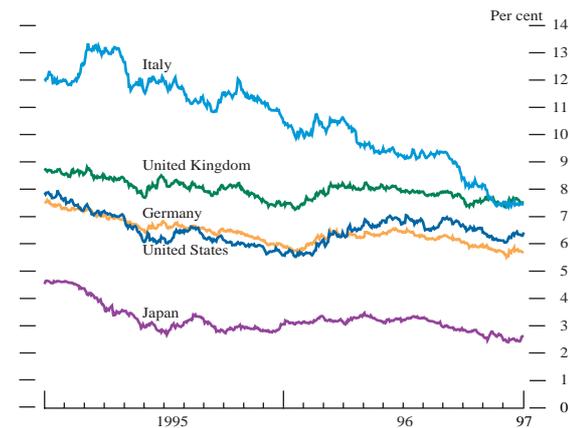
Source: IFR Omnibase.

Historically low nominal interest rates in the United States may have encouraged US corporate borrowers to bring forward their financing needs to lock in to current interest rates.

European convergence

Trades connected with the likely timing of participation in European Monetary Union continued to affect bond yields. In particular, the falling spread between German Bunds and Italian BTPs may have, in part, reflected an expectation that Italy would take part in the first wave of EU membership in 1999; economic conditions in Italy may also have contributed to the fall in Italian yields. Also, the actual and proposed fiscal tightening linked to the single currency preparations in Europe may have helped to improve liquidity in the euro markets.

Chart 3
Ten-year government bond yields



Source: Bloomberg.

Emerging markets

Emerging market issuance was particularly strong in 1996. Investors were reported to be searching for higher yields, which continued to fuel demand for emerging market debt. Several other factors contributed to higher levels of emerging market issuance, including: better economic fundamentals in emerging market countries; efforts by countries such as Mexico, the Philippines and Argentina to lengthen the maturities of their debt; and economic liberalisation in Eastern Europe and South America, which has given companies improved access to international capital markets.

Argentina, for example, made its first international offer of peso-denominated debt. The \$250 million offer helped to double the average maturity of Argentinean debt from four years in 1995 to eight years in 1996. The Argentinean Government plans to build a peso-yield curve up to ten years.

In August, the Russian central bank permitted foreigners to access the market in short-term rouble-denominated state bonds, known as GKO, in an effort to make rouble bonds internationally traded instruments. (Previously, foreign investors could buy GKO only through designated Russian banks.) The central bank raised \$1 billion in its first international bond issue since 1917, which was more than two times oversubscribed. It was reported that 44% of the issue was placed with investors in the United States, 30% in Asia, and 26% in Europe. Following that success, Russia's municipal authorities and large corporates may be encouraged to issue international bonds.

There is some concern that investors may underestimate the higher risks that come with high yields in emerging markets: for example, there is little experience of finding solutions to debt servicing difficulties in emerging markets. Previous financial crises have involved banks and official institutions, rather than widely dispersed bond investors, which has made work-outs easier to co-ordinate.

Increased activity in emerging market debt has led to plans to form a new clearing house, specialising in emerging

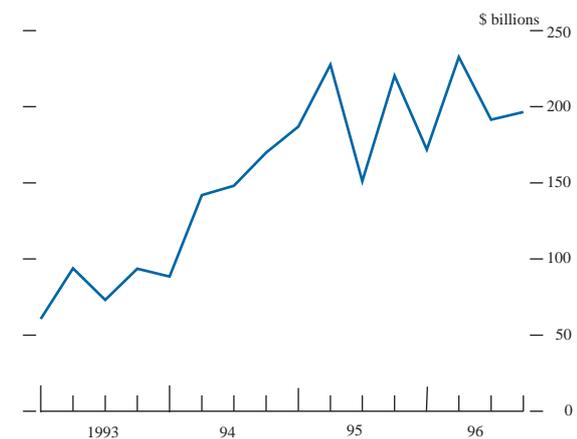
markets. The Emerging Market Traders Association and the International Securities Clearing Corporation have signed a memorandum of understanding to set up the Emerging Market Clearing Corporation (EMCC). The new clearing house will manage counterparty risk with the aim of increasing market efficiency and will be limited initially to clearing trades in Brady bonds, currently the most liquid emerging market securities.

International syndicated credits

Announcements of international syndicated credits in 1996 were slightly higher than in 1995. Some of the major UK deals involved the financing of take-overs, such as the \$800 million five-year dual-currency facility used by Great Universal Stores in its acquisition of Experian.

In the fourth quarter of 1996, average syndicated credit spreads widened to around 75 basis points. The first three quarters of 1996 had seen credit spreads of around 20–40 basis points.

Chart 4
International syndicated credit announcements



Source: IFR Omnibase.

Sterling issues

With sterling continuing to appreciate and UK bond yields remaining high relative to other markets, overseas demand for sterling assets encouraged further substantial issuance of sterling bonds in the fourth quarter. Total fixed-rate issuance was £6.8 billion, taking it to a total for 1996 of £21 billion, double that in 1995 and the largest annual total since 1993. There were four domestic debenture issues within this total, raising £228 million, but the bulk of fixed-rate issuance was in the form of eurosterling.

Fixed-rate issuance in the quarter included £2.7 billion of shorter-dated bonds and £2.1 billion of mediums (of which £1.2 billion was for seven-year maturities). Most of the £3.8 billion of up to seven-year bonds were issued by overseas issuers, notably continental financial institutions looking to take advantage of attractive swap rates. There was also substantial longer-dated issuance, totalling £2.8 billion. This included £740 million from five issues which, although perpetuals, all incorporated a call or yield step-up option after ten (or in one case 25) years.

European high-yield bonds

Since the 1980s, the market in high-yield, and higher risk, bonds has been concentrated in the United States. Recently, however, there has been some suggestion that a similar market could develop in Europe.

Some commentators have suggested that there are key differences between Europe and the United States which may make it less easy to develop a high-yield bond market along the lines of that in the United States:

- investors within the United States may have a greater appetite for credit risk: US corporates generally have higher gearing levels than their European counterparts and leveraged buyouts are far more common in the United States than they are in Europe. There are also significant differences in attitudes towards corporate financing. For example, banks still play a dominant role in the financing of businesses in Germany; and
- in Europe, the development of a high-yield bond market might become more concentrated in sovereign emerging market debt which is an attractive alternative to high-yield domestic corporate debt. Sovereign bonds tend to have low credit risk, but provide high yields due to their currency risk.

Although the above differences may have impeded a high-yield market in Europe, there are signs that the economic conditions could now be right for a market to develop:

- the trend towards disintermediation could encourage medium-sized companies to issue bonds rather than borrow from banks;
- a stable economic environment and historically low interest rates could encourage European investors to look for higher yields in domestic markets;
- the introduction of Economic and Monetary Union (EMU) and the subsequent elimination of currency risk within the EMU area could lead securities houses in Europe to concentrate their business more on taking credit risk; and
- an increase in mergers and acquisitions in the United Kingdom has already led to more leveraged buyouts.

Although the conditions for a high-yield bond market in Europe are favourable, there are currently no clear signs of one developing. However, if there is a reverse in economic conditions in the emerging markets or if yields in Europe begin to rise, investors may begin to look at domestic high-yield corporate bonds more seriously.

There was significant growth in the UK asset-backed securities market over the quarter, with eleven issues raising over £5 billion. Structured deals were used to finance acquisitions: a three tranche deal—£550 million fixed-rate and £354 million floating-rate—financed the purchase of army personnel properties previously owned by the Ministry of Defence (MoD), the bonds secured against rental income guaranteed by the MoD until 2021; Stagecoach's acquisition of train rolling stock leasing company Porterbrook was refinanced by the issue of bonds secured against the company's future leasing payments from train operating companies, which are 80% government guaranteed. These deals helped to boost FRN issuance—indeed, all but £450 million of the £5.1 billion FRNs issued in the quarter were asset-backed securities. This took the amount raised in FRNs during 1996 to £12.5 billion, substantially more than any previous year.

Despite the high level of issuance in the quarter, high levels of demand for sterling paper caused spreads to remain narrow.

Total outstanding sterling commercial paper rose to £7.3 billion by the end of the fourth quarter, £0.2 billion higher than at the end of September. Outstanding sterling medium-term notes rose by £1.4 billion to £20.8 billion at end-December.

Other developments

German minimum reserve requirements on Bund repos of less than one year were lifted in December 1996, reducing

the cost of this type of transaction in Germany. It is estimated that around 60% of current Bund repo business is done in London, mainly by large US investment banks. German banks are likely to repatriate some of their business.

Japan is considering a change to its rules on withholding tax that would allow holders of Japanese eurobonds to receive their interest gross of tax only if they registered their name. Any change would affect mainly Japanese residents, since they hold over 95% of Japanese eurobonds; but currently all overseas investors in Japanese eurobonds also receive interest gross.

A Canadian high-yield bond market has developed over the past year. Retail demand is likely to have been a driving force: five high-yield bond mutual funds have started up in Canada over the past year, with total assets of around C\$200 million. Canadian issuers are currently the largest issuers of Yankee debt and are among the largest issuers of high-yield debt.

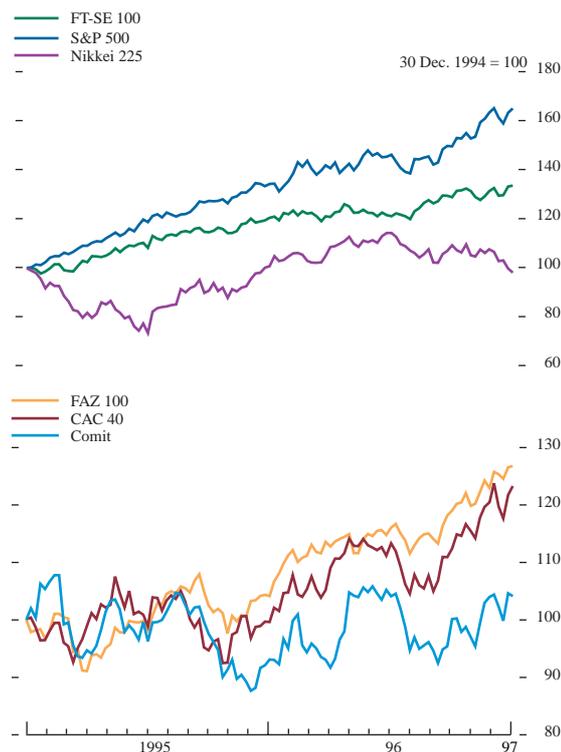
Equity markets

Prices

Equity prices on most of the major exchanges increased in 1996 and, following some price falls in the summer, the fourth quarter was strong.

The US equity market continued to rise, with the S&P 500 index 7.8% higher over the quarter, bringing its increase for the whole of 1996 to 20.3%. These high levels prompted

Chart 5
Equity indices^(a)



Source: Individual exchanges.

(a) End-week prices; data to 27 December 1996.

concern that the market might be overvalued, but productivity gains by listed companies, underpinned by steady economic growth, would seem to justify higher share valuations. Much also depends on the method of valuation: dividend yields, for example, were at an historic low; but dividend return is only part of the explanation, especially considering the recent spate of share buybacks. Other valuation measures, based on total share-holder earnings, might be more relevant, and these point less strongly to overvaluation.

Considerable uncertainty was evident, however, with prices reacting adversely to any suggestion that interest rates might have to be raised. Liquidity in the US market was, nonetheless, strong, with evidence of sustained demand from domestic investors. Over the longer term, market analysts expect a switch from publicly funded into privately funded pension funds which would underpin demand on a sustained basis. In addition, institutional inflows from Japan were reported to be strong. There was little expectation among commentators that the US equity market would fall sharply in 1997, though most felt that there could be a 'correction' should inflation rise more than expected.

Canadian equity markets were even stronger than those in the United States, with the TSE 300 index rising 12% over the quarter and 25.7% over the year.

Continental European equity markets were buoyant. The strength of the US market was partly responsible, but the

efforts of European governments to meet the Maastricht criteria were also seen by investors as positive for equities. Prices in core equity markets continued the steady growth seen earlier in the year, with the German FAZ index rising 7%, 21.6% on the year, and the French CAC index rising 8.6%, 23.7% on the year. Rising equity prices were underpinned by falling bond yields, particularly in those countries where risk premia have historically been considered high: Spanish equities were particularly strong, rising 20.8% over the quarter, 39% over the year; Italian equities rose 4.8% over the quarter to record a gain of 13% over the year. Scandinavian equity markets outperformed the rest of Europe, with Finnish equities the strongest in Scandinavia over the year, gaining 46.5%; strong inflows from foreign investors were reported to be an important factor during 1996.

The UK equity market rose by less than its US and continental European counterparts during 1996, but still hit record highs: the FT-SE 100 index reached a new high, of 4,118, on 31 December. Over the fourth quarter, the index gained 4.2%, 11.6% over the year. Differing interest rate expectations are likely to have been a major reason for the UK market's relative underperformance, especially following the rise in official interest rates in late October, when UK rates were perceived to be more likely to rise than those of continental European countries. Some investors became concerned, too, that the strength of sterling, if it continued into 1997, could hit the earnings of exporting companies and thus would lead to a fall in dividends.

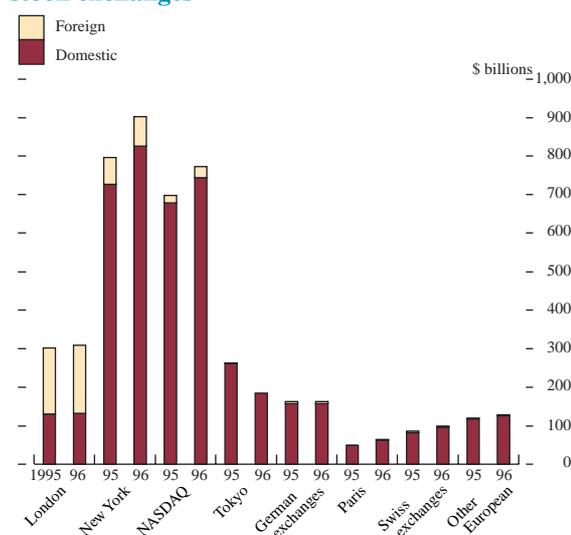
Most of the major equity markets in Asia were, by contrast, weak. In Japan, a slower-than-expected economic recovery and continued concerns over the fragility of the financial sector contributed to a fall of 10.2% in the Nikkei index over the quarter and of 2.5% over the year. Singaporean equities, although recording a small gain in the fourth quarter, declined by 2.2% over 1996 as a whole. The Hong Kong market was an exception, boosted by reduced expectations of higher US interest rates (to which Hong Kong interest rates are directly related), with the Hang Seng index gaining 13% over the quarter and 33.5% over the year.

Turnover

Equity turnover volumes continued to rise in the third quarter (the most recent data available). Compared with the third quarter of 1995, turnover on the New York Stock Exchange increased by 13% and on NASDAQ by 11%. Of the major European exchanges, Paris showed the biggest proportional increase in volumes, up by 28% on the third quarter of 1995. Turnover volumes in Japan declined by a third compared with the third quarter of 1995. The increases in turnover volumes in European exchanges did not appear to represent repatriation of business from London, where volumes for both domestic and foreign shares remained steady.

Turnover on Tradepoint, the UK-based electronic exchange competing with the London Stock Exchange, grew strongly

Chart 6
Turnover of domestic and foreign equities on major stock exchanges^(a)

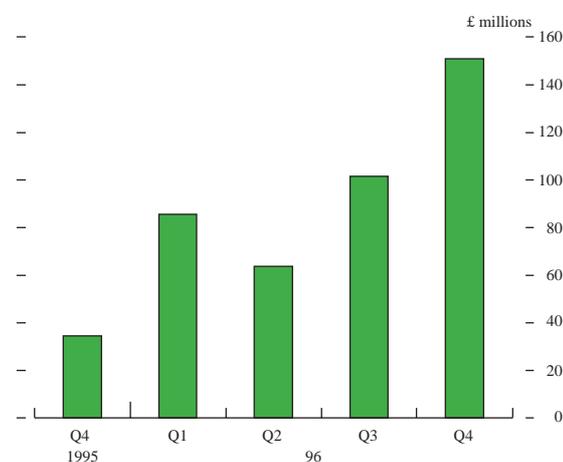


Source: Individual exchanges.

(a) Turnover in the third quarter of year indicated.

in the fourth quarter, to £151 million, compared with £102 million in the third. December was particularly active, with volumes on one day (18 December) greater than those for November as a whole. But Tradepoint's share of the UK equity market remains very small.

Chart 7
Tradepoint turnover



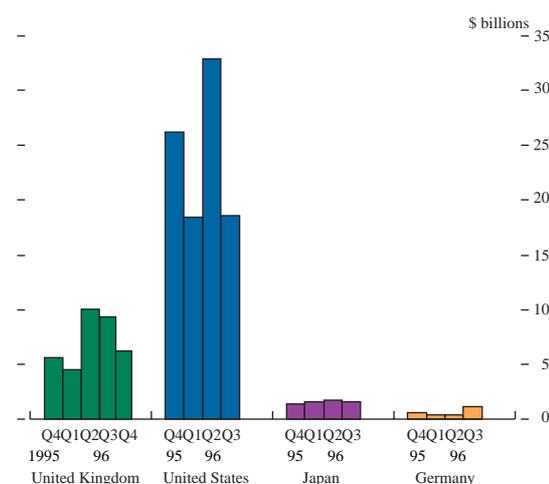
Source: Financial Times.

Equity issuance

New equity issuance in 1996 was very strong, particularly in the United States and Europe. After reaching record levels of \$32.9 billion in the second quarter, new issuance activity in the United States fell back in the third quarter to \$18.6 billion, perhaps related to an increased expectation of a rise in interest rates. Seasonal factors and uncertainty over the future direction of the equity market may also have been responsible. Initial figures indicate that issuance is likely to have rebounded in the fourth quarter, with a record 106 initial public offers launched in October alone—more than in the third quarter as a whole.

At least four major European companies made large issues during 1996, each of at least \$1 billion. Capital issuance in Germany more than doubled in the third quarter, compared with the second, with \$1.2 billion raised; this may have reflected increased interest in the equity market shown by German investors ahead of the Deutsche Telekom flotation in November 1996. In Europe, privatisations continued to boost issuance levels in the fourth quarter. These included the Italian government's offering of \$5 billion of shares in ENI. In Japan, new issuance remained subdued, with \$1.6 billion raised during the third quarter, compared with \$1.8 billion in the second.

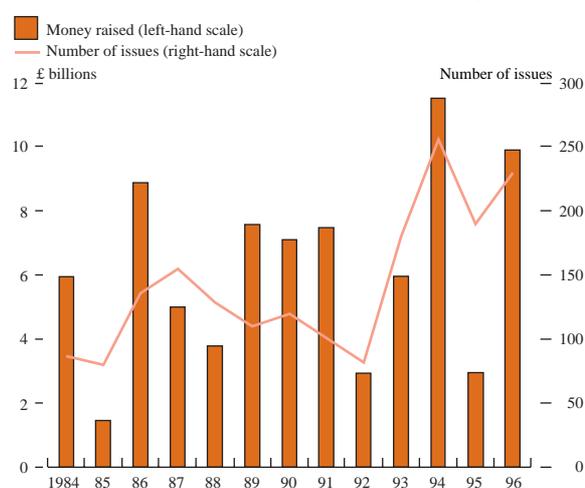
Chart 8
Equity capital raised in major stock exchanges



Source: Individual exchanges.

New equity issuance in the United Kingdom in the fourth quarter totalled £1.5 billion. The total of new issues for 1996 as a whole was £9.9 billion, boosted by privatisation issues from Railtrack in May (£1.9 billion) and British Energy in July (£1.4 billion).

Chart 9
New issues on the London Stock Exchange 1984–96



Source: London Stock Exchange.

Issuance by companies on the Alternative Investment Market (AIM) was strong for most of the fourth quarter, although it fell back towards the end of the year.

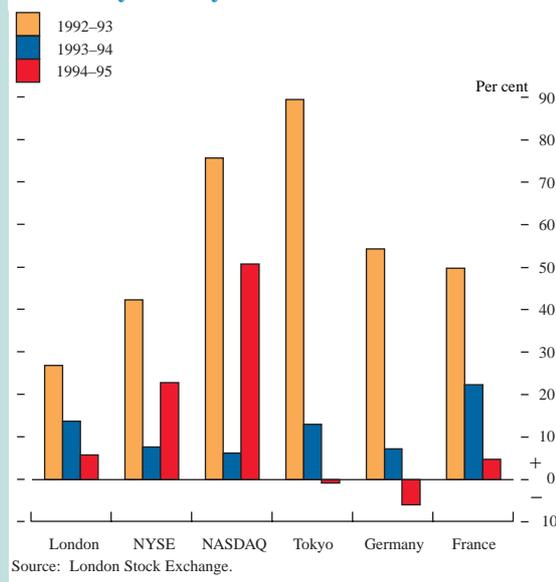
Foreign equity turnover in London

London is one of the major equity markets in the world, alongside the New York Stock Exchange, NASDAQ and the Tokyo Stock Exchange. In recent years, exchanges elsewhere—particularly in Europe—have been attempting to increase their share of trading volumes.

Exchanges measure turnover in a variety of different ways, and variations in the way shares are traded mean that direct comparisons between exchanges are difficult. Furthermore, some transactions might be reported to more than one exchange, and others are not reported at all. So aggregation across markets can be misleading.

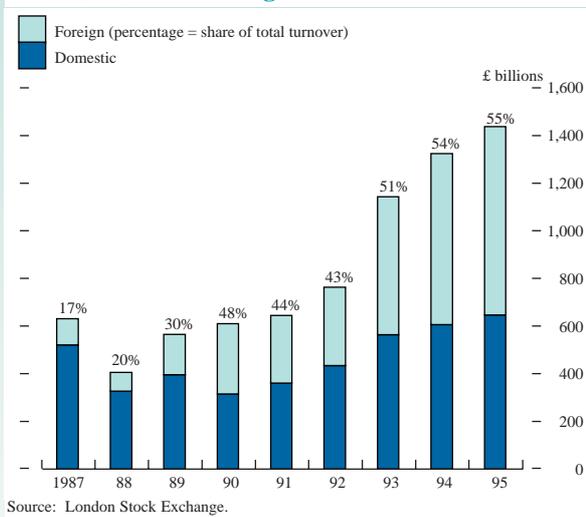
It is possible, however, to compare the *growth rates* of different markets. Chart A suggests that equity turnover has increased worldwide, in recent years, in the relatively deep US markets as well as in German and French markets. The growth of turnover in London has been steady.

Chart A
Percentage change in annual domestic equity turnover year on year



One aspect of the London equity market which makes it unique is the proportion of foreign equities traded through it—far more than any other exchange. As Chart B shows, more than half of turnover reported by London Stock Exchange intermediaries is for non-UK shares,

Chart B
Turnover in domestic and foreign equities on the London Stock Exchange



and this proportion has grown over the past decade.

When these data are further sub-divided according to the nationality of shares traded, there is no indication of a diminution of the market share of London's intermediaries (see the table).

Turnover of non-UK shares in London

£ billions; percentages in italics

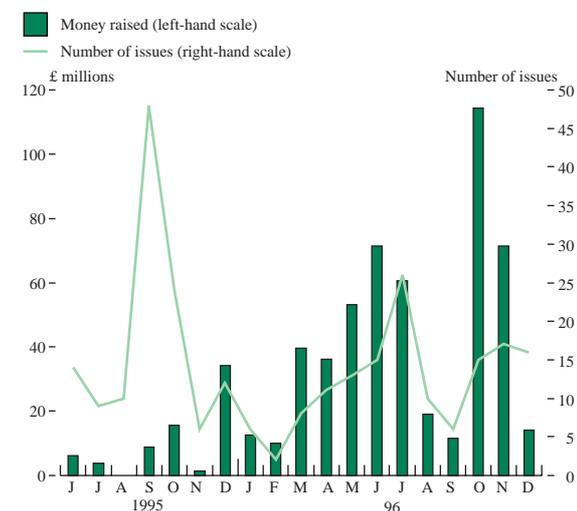
Domicile	1993	1994	1995	
Japan	57	83	85	<i>21</i>
France	52	51	63	<i>16</i>
Germany	43	40	40	<i>10</i>
Scandinavia	19	29	38	<i>10</i>
Netherlands	22	27	36	<i>9</i>
Switzerland	23	26	27	<i>7</i>
United States	17	24	26	<i>6</i>
Italy	15	25	24	<i>6</i>
Other Europe	15	16	19	<i>5</i>
Other	27	38	39	<i>10</i>

SEAQ-International, the Stock Exchange's bulletin board for foreign stocks, seems to be being used less frequently than in the past, with deals more often carried out on local, especially European, exchanges. However, it is clear from the data that London Stock Exchange intermediaries are still participating in this business.

London remains a leader in the trading of foreign equities. The continuing presence of international financial firms in London suggests that London's position as a major equity market will remain for the foreseeable future.

Forty-eight new companies came to the market during the fourth quarter, raising £200 million; on both counts, it was the best quarter yet for AIM. The total raised through new issues on the AIM market over the year as a whole was £514 million, compared with only £76 million raised on AIM and its predecessor, the USM, in 1995.

Chart 10
New issues on the Alternative Investment Market



Source: London Stock Exchange.

Structural developments

The London Stock Exchange announced that it planned to introduce its new electronic order book for FT-SE 100 stocks on 20 October 1997, but would confirm this date during the summer, subject to the achievement of key development milestones by member firms. The Exchange proposes that, when the new system is introduced, normal deals in the most liquid stocks would be carried out through an electronic order book; but member firms would be able to carry out large trades, of six times normal market size (NMS) or more, outside the order book. Market-making in these stocks would cease but it would continue to be used for less liquid stocks.

The new regime for stamp duty, which extends relief from market-makers to all exchange intermediaries, is also to be introduced during 1997.

The transition from Talisman to CREST, the new, dematerialised, electronic equity clearing and settlement system, continued largely as planned during the quarter, although the transition of some stocks was delayed to allow users more time to adapt to the new settlement regime. The transition is scheduled to be completed by April 1997.

Changes to the rules of AIM were announced in December, as part of the ongoing review of the Stock Exchange's market for small and growing companies. Since January 1997, companies have been required to announce their intention to join the market ten days beforehand and to

include more detail on minority shareholdings and working capital. They are also now required to include prominent warnings on their admission documents about the risks of investing in AIM shares.

EASDAQ, the new pan-European equity market for small companies, opened for business in October and four companies joined the market before the end of the year, raising \$233 million.

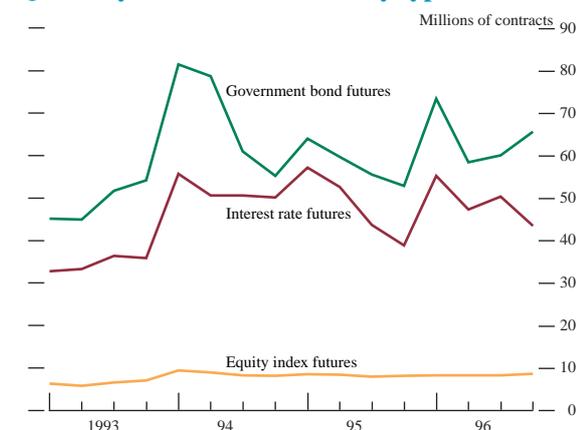
Derivatives markets

Derivatives exchanges

Turnover

Turnover on all the major derivatives exchanges except the *Marché à Terme International de France (MATIF)* was higher in the fourth quarter of 1996 than in the corresponding quarter in 1995. Turnover on the major European derivative exchanges grew most strongly in the second half of the year. This probably reflected position-taking and the hedging of OTC trades driven by EMU convergence and more pro-active EMU strategies by exchanges. In contrast, turnover on the major exchanges outside Europe was lower in the fourth quarter than in the third.

Chart 11
Quarterly turnover of futures by type^(a)



Sources: FIA and individual exchanges.

(a) Turnover in the major futures contracts listed on the CME, CBOT, LIFFE, DTB, MATIF and LIFFE.

Government bond futures activity rose in the fourth quarter compared to the third, with growth in most major bond contracts; but interest rate futures volumes fell, reflecting a reduction in turnover of the Chicago Mercantile Exchange's (CME) eurodollar contract, MATIF's PIBOR Contract and the Tokyo International Financial Futures Exchange's (TIFFE) euroyen contracts. Eurodollar futures volumes remain, however, by far the largest among interest rate futures contracts.

Turnover on the London International Financial Futures and Options Exchange (LIFFE) increased by 14% from the third quarter to the fourth, and was 51% up on the fourth quarter of 1995.⁽¹⁾ The long gilt contract grew most strongly of

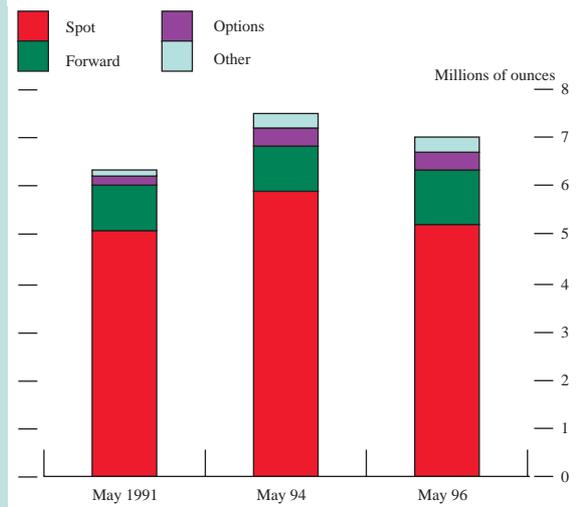
(1) LIFFE merged with the London Commodities Exchange on 16 September 1996. From October 1996, LIFFE volumes include those of the LCE. (LCE business accounts for some 2%–3% of LIFFE volume.)

London bullion market: a survey of turnover

The Bank conducted a survey of turnover in the London bullion market in May 1996. This was the fourth to be conducted since 1990. It provides a useful indicator of the size and structure of the London market and the trading patterns that are emerging. Data were obtained on a range of 'over-the-counter' gold and silver products including spot transactions, forwards and options. The institutional coverage of the survey was limited, however, to the market-making members of the London Bullion Market Association (14 in May 1996), so the survey is not representative of total activity in the London market.⁽¹⁾

The profile of the London gold market that emerged was very similar to that obtained in the previous survey in May 1994. Average daily turnover in gold reached approximately 7 million ounces, compared with 7½ million ounces reported in 1994 (see Chart A). A higher gold price in May 1996 meant that the value of

Chart A
Average daily gold turnover

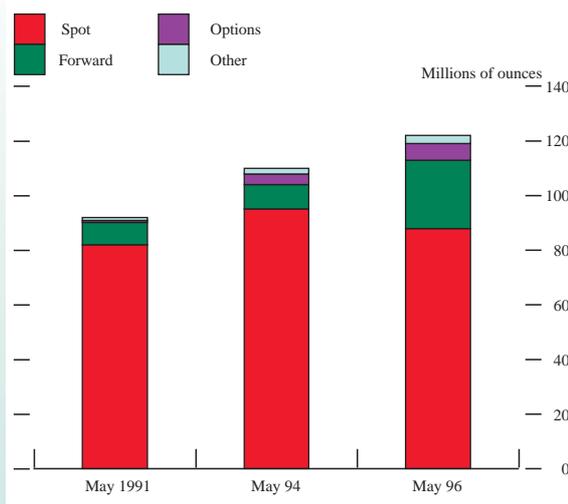


these transactions—almost \$3 billion each day—remained largely unchanged. There was also little

change in product composition, with spot transactions continuing to account for around three quarters of total turnover. There was, however, a small rise in the share of activity (15%) accounted for by forward transactions.

In contrast, there have been some significant changes in the size and structure of the silver market. Activity continued to expand, with average daily turnover exceeding 120 million ounces in May 1996, an increase of more than 10% on May 1994 (see Chart B). In value terms, this represented approximately \$650 million of silver traded each day. Significantly, the most recent survey revealed a greater concentration of business in the forwards: more than 20% of silver trades were forward transactions, almost three times that recorded in 1994. There was a corresponding decrease in the share of activity accounted for by spot transactions.

Chart B
Average daily silver turnover



Taken together, the combined value (in US dollar terms) of gold and silver activity just exceeded that recorded two years ago, providing evidence of the depth and liquidity available in the London bullion market.

⁽¹⁾ The significant amount of business undertaken by the 50 or so ordinary members of the LBMA falls outside the scope of this survey, as does the large amount of business that is conducted outside the United Kingdom but on a loco-London basis. The survey encompasses trading undertaken by the market-makers in both an agency and principal capacity.

products at LIFFE, followed by short sterling, the Italian BTP and German Bund contracts.

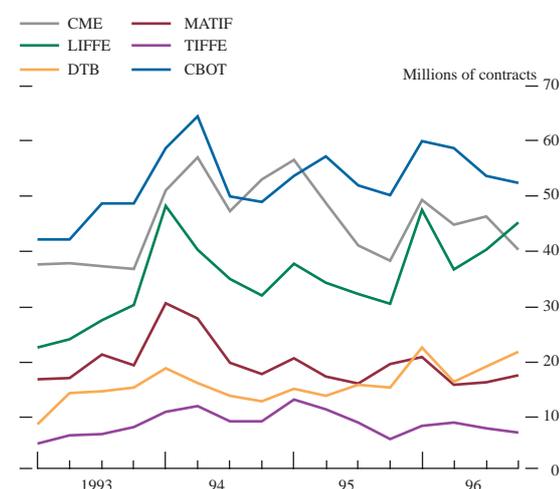
Turnover on the Deutsche Terminborse (DTB) also increased strongly: by 24% compared with the previous quarter and by 43% compared with the same quarter in 1995, reflecting growing volumes in the Bund contract. Indeed, the DTB's share of Bund futures—which are also traded on LIFFE—rose to 32% in the fourth quarter, from 28% in the fourth quarter of 1995. Volumes on MATIF rose by 6% in the fourth quarter, mainly due to increased

turnover in the Notional contract during the quarter. However, MATIF's overall volumes appear to be on a downward trend, with 1996 volumes 4% lower than those of 1995. This is largely accounted for by a continued reduction in activity on the PIBOR short-term interest rates contract.

In the United States, turnover on the Chicago Board of Trade (CBOT) decreased by 3% compared with the third quarter and increased by 4% compared with the fourth quarter of 1995. Turnover on the CME declined

by 13% compared with the third quarter and increased by 6% over the year. The reduction in activity is largely accounted for by lower turnover in the CME's Eurodollar contract. Turnover on TIFFE declined by 11% on the previous quarter but was 23% higher than the fourth quarter of 1995.

Chart 12
Quarterly turnover on major derivatives exchanges



Sources: FIA and individual exchanges.

Other developments

European exchanges have adopted more pro-active strategies ahead of Economic and Monetary Union (EMU). For example, LIFFE, the DTB and MATIF have all amended their contract specifications so that, from 1999, contracts will be denominated in euros if the relevant currency is part of EMU; LIFFE and the DTB have also introduced one-month euromark contracts.

Exchanges are also increasing their reach: the DTB has made its screens available in the United States, is reducing the cost of its trading, and plans to amend its membership requirements to make it easier for foreign firms to participate directly. LIFFE plans to activate linkages with the CBOT and CME for 1997. MATIF has planned a similar link with the CME.

The launch of the International Petroleum Exchange's first natural gas futures contract took place on 31 January 1997. The contract was developed in response to liberalisation of the UK gas market and the consequent increase in spot trading, and allows trading in gas already within the United Kingdom's National Transmission System. The monthly contract is based on daily deliveries of gas at the National Balancing Point. The contract is traded exclusively on the IPE's new Electronic Trading System.

The Securities and Investments Board published a report on the London Metal Exchange (LME) in December, following a review of the metals markets. The review began in June—at the LME's request—following problems associated with trading losses at Sumitomo Corporation, and was based on

responses to a global consultation exercise (see the August and November 1996 *Quarterly Bulletins*). A number of recommendations for changes were made to strengthen and develop the LME's regulatory structure and to reflect changes in the market.

OTC derivatives markets

Although there are few statistics on the most recent activity in the OTC derivatives markets, the available data suggest that worldwide volumes continued to grow throughout 1996. Data produced by the International Swaps and Derivatives Association (ISDA) show that notional outstandings on OTC derivative contracts continued to grow, from £8.8 trillion at the end of June 1995 to £13.6 trillion at the end of June 1996. (The ISDA reporting population is, however, variable, and these data cannot be compared easily with those from other sources.) UK banks' notional outstandings also show a broadly increasing trend, from £5.4 trillion at end-June 1995 to £6.4 trillion at end-June 1996.

Table D
OTC derivatives

UK banks' activity and credit exposures at end-period (£ billions)

	1993		1994		1995		1996
	H1	H2	H1	H2	H1	H2	H1
Notional principal outstanding	2,990	3,399	4,747	4,756	5,355	5,187	6,354
Of which:							
Interest rate-related	1,849	2,333	3,300	3,356	3,927	3,783	4,575
Foreign exchange related (a)	1,141	1,066	1,447	1,400	1,428	1,404	1,698
Equities-related							71
Commodities-related							8
Precious metals-related							2
Replacement cost		65	67	76	65	90	93
Of which:							
Interest rate-related		34	44	37	38	51	61
As a percentage of NP		1.8	1.9	1.1	1.1	1.3	1.6
Foreign exchange related (a)		31	23	39	27	39	32
As a percentage of NP		2.7	2.2	2.7	1.9	2.7	2.3
Equities-related							4
Commodities-related							
Precious metals-related							
Credit equivalent exposure	87	89	108	97	125	127	121
Credit risk	22	23	26	24	31	31	26
Credit risk as a percentage of risk-weighted assets	5.2	5.4	5.9	5.4	7.3	7.4	n.a.

n.a. = not available.

Note: Due to changes to the basis of reporting, 1996 H1 data are not comparable with earlier periods.

(a) Foreign exchange data include equities, commodities, and precious metals prior to 1996 H1.

Activity in 1996 was boosted by two particular factors. First, yield curve convergence trades based on the likelihood of EMU were very popular (see article in August 1996 *Quarterly Bulletin*). Initially, such trades tended to focus on the convergence of interest rates in Germany and France, although by the latter part of the year peseta and lira activity was also boosted. Second, the high level of bond issuance referred to earlier in this article will have provided added impetus to swap business, much of which is directly linked to it and enables borrowers to tap a wider range of capital markets.

Spreads remained narrow, especially in plain vanilla products, partly reflecting increased competition from new entrants to the markets—in particular European banks.

The use of collateral continued to grow in the OTC derivatives markets as firms looked for ways to manage their growing credit exposures more effectively. Firms that have set up in-house collateral management systems may have developed a competitive advantage over those that have not, with the number of counterparties able—and wishing—to trade on a collateralised basis increasing

steadily. Cedel introduced a collateral management arrangement at the end of September and the CME announced in October that eleven banks and financial institutions had agreed to become charter members of its depository for swaps collateral; the depository will standardise and automate the process of managing collateral used to guarantee OTC swaps transactions.

Recent yield curve behaviour—an analysis

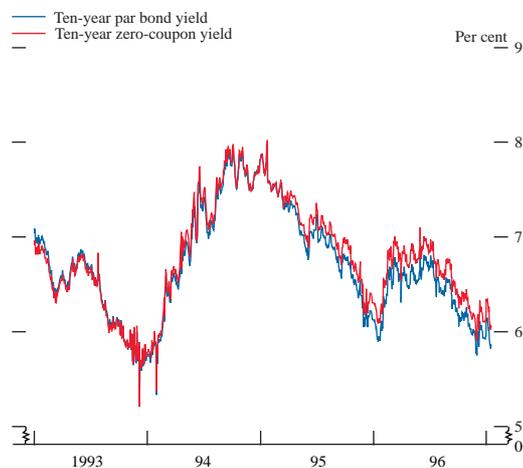
By Bill Allen, Deputy Director, Monetary Analysis.⁽¹⁾

This article analyses recent fluctuations in ten-year bond yields in six countries using an estimation technique to decompose them into different maturity segments, and draws conclusions about the effects on ten-year yields of the changing state of the business cycle and of changing longer-term inflationary expectations.

The analysis uses the yield curve estimation technique developed by Svensson (1994)⁽²⁾ to infer from the constellation of government bond prices zero-coupon yields—that is, the implicit yield of hypothetical bonds which have no interest or coupon payments but only a capital repayment. Although the technique requires various assumptions to be made, and it does not generate unique estimates of implicit yields, it nevertheless produces interesting results. This analysis aims to explain fluctuations in ten-year zero-coupon yields in the United States, Japan, Germany, the United Kingdom, France and Italy. Ten-year zero-coupon yields are of course not the same as ordinary ten-year bond yields, but they are much more easily analytically tractable; and in any case zero-coupon yields are the logical building blocks out of which ordinary bond yields are formed. Moreover recent fluctuations in ten-year zero-coupon yields and in ten-year par bond yields have been very closely aligned, as Chart 1, which shows German yields, illustrates.

The method of analysis is to decompose movements in ten-year zero-coupon yields into three components:

Chart 1
Comparison of German ten-year par bond yields and zero-coupon yields



- current two-year zero-coupon yields (0–2 year yields);
- the three-year zero-coupon yields two years in the future implicit in the current yield curve (2–5 year yields); and
- the five-year zero-coupon yields five years in the future implicit in the current yield curve (5–10 year yields).

This decomposition is a matter of arithmetic: the ten-year zero-coupon yield is a well-defined function of those three components and nothing else. The decomposition is interesting because the components are likely to reflect different influences in different degrees. Specifically, 0–2 year yields are likely to be the most affected by the state of the business cycle. Even if longer-term inflationary expectations were uniform across the world, countries where activity was cyclically strong and capacity utilisation high would have higher 0–2 year yields than countries where activity was cyclically weak and capacity utilisation low.

The business cycle is likely to have a relatively much weaker effect on the 5–10 year component. It is hard for the market to predict in what cyclical phase a country will be five years in the future; moreover 5–10 year yields embrace a period long enough to encompass more than one phase of the business cycle and are likely to reflect something closer to an ‘average’ business cycle phase. By contrast, longer-term inflationary expectations are likely to be relatively a much stronger influence on 5–10 year yields.

Those are the two extremes. As to the middle component, 2–5 year yields, the influences of the business cycle and of inflationary expectations seem likely to be more evenly balanced.

Of course other factors may also cause the shape of zero-coupon yield curves to change—for example, changes in the degree of uncertainty attached by the market to expectations of future yields. But such other influences are not separately identified or discussed in this article.

(1) The article is based on a talk given by Mr Allen at a seminar on ‘Central banks and long-term interest rates’ organised by the Camera di Commercio in Novara, Italy on 11 January 1997.

(2) Deacon and Derry (1994a and b) describe the application of the Svensson technique.

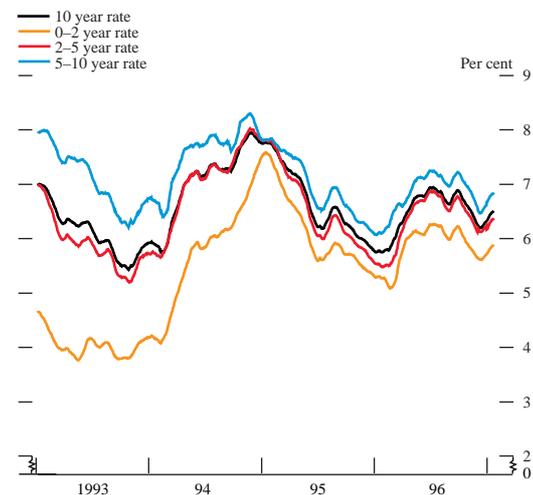
I have examined the period since the beginning of 1993. There was a worldwide fall in yields in 1993, and a convergence of yields (so that international yield differentials generally narrowed). The pattern was largely reversed in 1994, notably after the tightening in US monetary policy in February that year. Yields peaked in November 1994 and there was a steady fall until the end of 1995. Yields rose again during the first five months of 1996 (though not in Japan) but have fallen back since then.

Results

United States

There has been no clear trend in ten-year zero-coupon yields, upwards or downwards, over the period, but they have fluctuated within a range of about 240 basis points (see Chart 2). But there has been a gentle upward trend in 0–2 year rates, which is perhaps not surprising as the US economy has been in the expansionary phase of a

Chart 2
Zero-coupon yields in the United States^(a)



(a) Twenty-day moving average.

business cycle throughout the period since 1993. Counterbalancing the upward trend in 0–2 year yields have been downward trends in 2–5 and 5–10 year yields. These trends seem likely to reflect declining inflationary expectations, which in turn could have been caused by:

- the greater-than-expected success of monetary policy in restraining inflation during the cyclical upswing; and
- unexpected success in reducing current and prospective future budget deficits, which among other things will have reduced the pressures for future inflation.

It might be expected that 0–2 year yields would fluctuate more widely than 5–10 year yields, because the state of the business cycle seems likely to be more volatile than longer-term inflationary expectations. Over the period, 0–2 year yields have in fact fluctuated more widely than 5–10 year yields, as the chart shows, but not much more widely. One possible explanation for the small size of the difference is that perhaps there have been significant

short-term fluctuations in longer-term inflationary expectations which have been separate from the cyclical influences on shorter-term yields but which have affected both shorter-term and longer-term yields.

Japan

Japan's experience has been quite different from that of the rest of the world. Yields have been much lower throughout the period and moreover there has been a strong downward trend (see Chart 3). The decomposition shows downward trends in all three components. There have been fluctuations in parallel with those of bond yields in the rest of the world, but they have been superimposed on the downward trends.

Chart 3
Zero-coupon yields in Japan^(a)



(a) Twenty-day moving average.

The fall in 0–2 year yields is readily explained by the prolonged period of slow economic growth in Japan, despite expansionary fiscal policy, and by the adoption of ultra-low short-term interest rates by the Bank of Japan in order to stimulate the economy. The behaviour of market interest rates will have been influenced by market expectations about how long the ultra-low short-term interest rate policy will need to last in order to stimulate economic revival. The evidence so far is that its expected duration has been continuously lengthening.

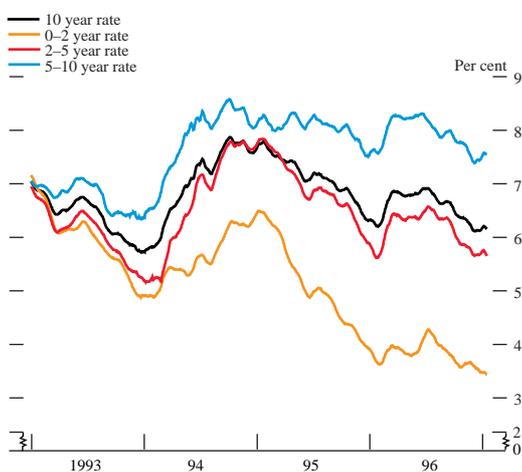
The reasons for the downward trend in 5–10 year yields are less easy to discern. It is possible that implicit forecasts of economic activity relative to the productive potential of the economy even 5–10 years ahead have been revised downwards, so that business cycle factors have had an influence at these maturities. Although inflation in Japan is very low—and probably negative if account is taken of various biases in measurement—the fiscal outlook is coloured by the large budget deficits which are the legacy of fiscal policies adopted in order to sustain economic activity, and in the long term by the implications of the ageing of the Japanese population. The extremely low level of 5–10 year yields in Japan is therefore puzzling. One possible explanation is that there are inhibitions to the capital outflows which would be needed to provoke a rise in yields.

Such inhibitions may have their roots in the experience of the mid-1980s when there were very large capital flows from Japan into US dollar-denominated securities. There followed a large depreciation of the dollar against the yen and consequent heavy capital losses to Japanese investors. It would not be surprising if current behaviour were influenced by that experience.

Germany

The profile of ten-year zero-coupon yields in Germany has been close to that in the United States, as indeed has the profile of ten-year par bond yields. The decomposition, in Chart 4, shows a quite different picture however. There is a strong downward trend in 0–2 year yields. This reflects the economic downturn which followed the post-reunification boom, and the subsequent rather hesitant recovery. There has also been a modest downward trend in 2–5 year yields.

Chart 4
Zero-coupon yields in Germany^(a)



(a) Twenty-day moving average.

However, there has been a modest upward trend in 5–10 year yields over the whole period: the rise that took place in 1994 has subsequently been only partly reversed. A plausible explanation of this upward trend is that it betrays market concern that the future European Central Bank will not be able to achieve as good a price stability record as the Deutsche Bundesbank.

As in the United States, 0–2 year yields have fluctuated more widely than 5–10 year yields. The difference in degree of fluctuation is greater than in the United States, but is still perhaps less than might have been expected.

The decomposition of the yield differential between the United States and Germany is shown in Chart 5. If the interpretation suggested in this article is correct, then the close correlation between US and German ten-year zero-coupon yields since 1993 has been a coincidence—the result of relative business cycle influences moving in one direction and relative long-term inflationary expectations moving in the other direction, for largely unrelated reasons.

Chart 5
US/German zero-coupon yield differentials^(a)



(a) Twenty-day moving average.

United Kingdom

There has been no clear trend, either upwards or downwards, in the UK ten-year zero-coupon yield, either in absolute terms or relative to its German counterpart, as Charts 6 and 7 show. There has been an upward trend in

Chart 6
Zero-coupon yields in the United Kingdom^(a)

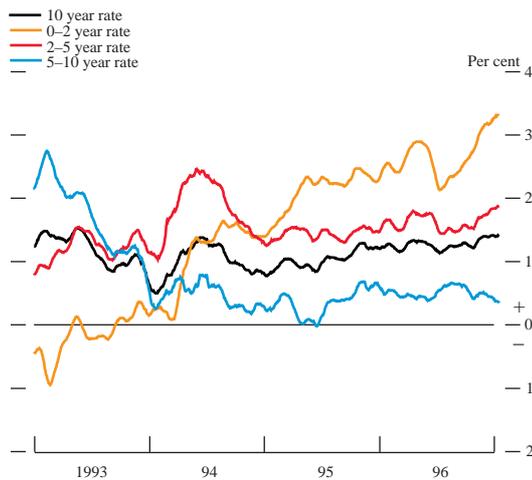


(a) Twenty-day moving average.

0–2 year yields since late 1993, which is readily explained by the sustained cyclical upswing in the UK economy, and which contrasts with the downward trend in German 0–2 year yields.

The 5–10 year zero-coupon yield declined sharply in 1993 and the differential with Germany also narrowed. No doubt this reflected unexpectedly low inflation in 1993 following sterling's departure from the exchange rate mechanism (ERM). The 5–10 year yield went up sharply in the first half of 1994, and there has been a gentle downward trend since the peak reached then. The differential with Germany in 5–10 year yields has fluctuated around an average of about 50 basis points since the end of 1993. This suggests that the credibility of UK monetary policy has not changed greatly relative to that of Germany since the end of 1993—though there are some reasons, as indicated above, for

Chart 7
UK/German zero-coupon yield differentials^(a)



(a) Twenty-day moving average.

thinking that Germany's monetary policy credibility has been adversely affected by the prospect of European Economic and Monetary Union (EMU). It also appears that since mid-1994 there has been a mild downward trend in longer-term inflationary expectations in the United Kingdom.

Another measure of the credibility of UK monetary policy is provided by the expected rate of inflation over the period beginning five years in the future and ending ten years in the future. This can be derived from yield curves calculated for conventional and index-linked gilt-edged stocks, and is shown in Chart 8. The profile is similar to that of the

Chart 8
Estimate of expected UK inflation over the period from five years in the future to ten years in the future^(a)

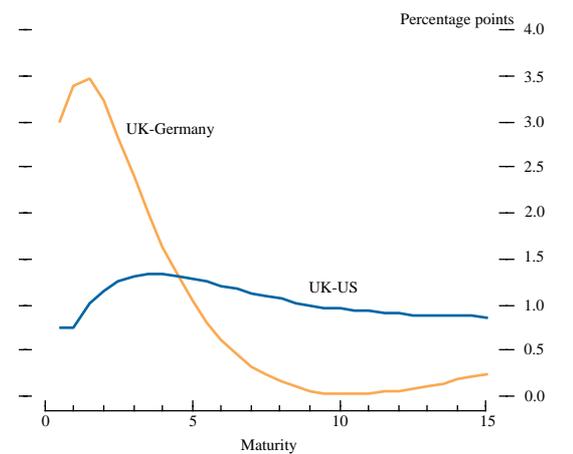


(a) Twenty-day moving average.

5–10 year zero-coupon yields, and likewise indicates a mild downward trend since mid-1994 in expected inflation.

The relationship between current UK ten-year zero-coupon yield differentials and the profile of expected future short-term interest rates is further illustrated by Chart 9, which shows expected UK/German and UK/US short-term interest rate differentials. There is a large

Chart 9
Expected short-term interest rate differentials as at 2 January 1997

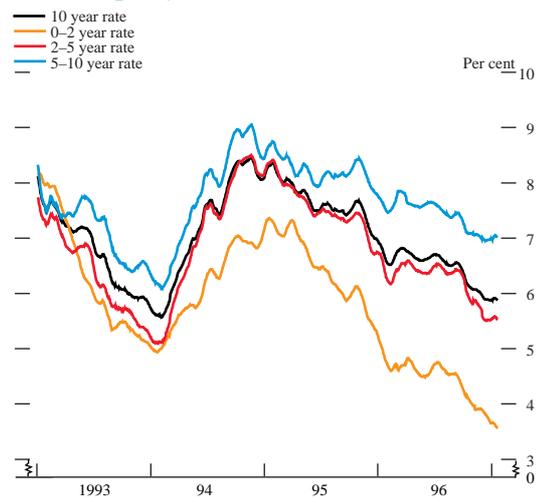


difference between the United Kingdom and Germany in the short-term interest rates expected to prevail in the next four years. This is likely to reflect the difference between the current cyclical position of the United Kingdom and Germany. By contrast, the UK/German short-term interest rate differential expected to prevail in the more distant future is very small indeed. The UK/US differential is much less variable.

France

Experience in France, illustrated in Chart 10, has been broadly similar to that in Germany. There has, though, been a mild downward trend in ten-year zero-coupon yields in France: in particular, the downward trend since the yield

Chart 10
Zero-coupon yields in France^(a)

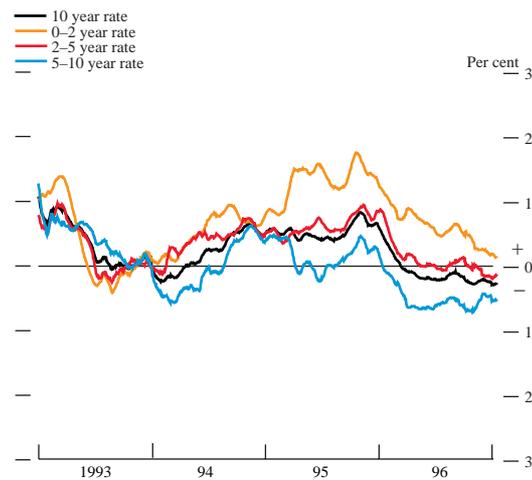


(a) Twenty-day moving average.

peak in late 1994 has been stronger in France than in Germany. As in Germany, there has been a downward trend in 0–2 year yields, but in contrast to Germany there has been no upward trend in 5–10 year yields.

The differences between French and German experience are illustrated more clearly in Chart 11, which shows the ten-year Franco-German zero-coupon yield differential and

Chart 11
French/German zero-coupon yield differentials^(a)



(a) Twenty-day moving average.

its decomposition. There is a modest downward trend in the ten-year yield differential, and in each of the three components. Perhaps surprisingly the 5–10 year zero-coupon yield in France has been lower than that in Germany since early 1996. This is hard to explain in the light of the expectation that France and Germany will both be part of EMU as from 1999. What possible explanations could there be?

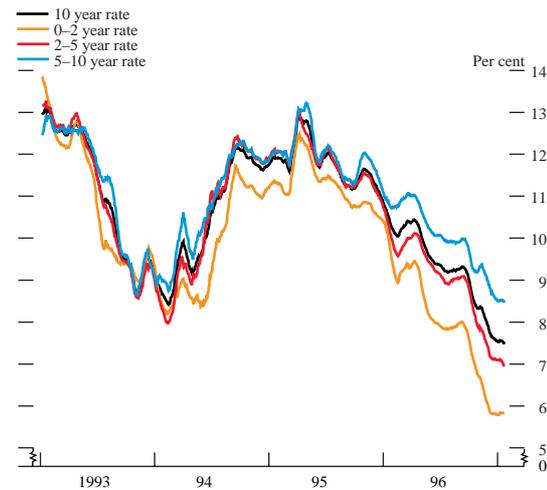
- Conceivably the market may attach some probability to the possibility that EMU may not take place—or at least, not on schedule in 1999. The size of the yield differential indicates that, in that case, the market expects inflation to be much lower in France than in Germany.
- The market, assuming that EMU will take place on schedule, may conceivably regard French government securities as a better credit risk than their German equivalents.
- Possibly the liquidity and other technical characteristics of the French government securities market are perceived as superior to those of the German market.
- Capital flows out of French government securities may be inhibited in some way. Specifically, after interest rates on saving deposits were reduced in January 1996, there were large inflows into insurance companies and mutual funds, which, beyond certain limits, typically invest largely in domestic government securities. But there is of course scope for other investors to switch out of French government securities if they so choose.

Of these explanations the latter two seem the most likely.

Italy

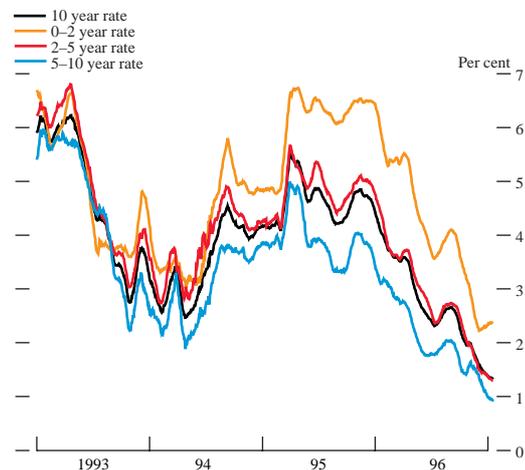
Italian ten-year zero-coupon yields have fallen dramatically since the beginning of 1993, both absolutely and relative to German yields (see Charts 12 and 13), and particularly since

Chart 12
Zero-coupon yields in Italy^(a)



(a) Twenty-day moving average.

Chart 13
Italian/German zero-coupon yield differentials^(a)



(a) Twenty-day moving average.

spring 1995. The decomposition shows that there have been downward trends in all three components. This appears to reflect a radical downward revision of longer-term inflationary expectations, partly reflecting falling actual inflation and partly associated with the belief either that Italy will join EMU or that Italian economic and monetary policy will be otherwise directed at sustainable price stability. Since spring 1995, yields have fallen by more at the 0–2 year maturity than at longer maturities, perhaps reflecting both the slowdown in the Italian economy and the reversal of the rise in short-term interest rates that took place in spring 1995 when the lira depreciated sharply in foreign exchange markets.

Conclusion

Ten-year zero-coupon yields can be decomposed into components which are likely to reflect different influences in different degrees. In particular, differences in the expected near-term paths of short-term interest rates, which arise because the countries concerned are in different phases of the business cycle, can account for a substantial proportion of longer-term yield differentials.

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Increasingly weightless economies

By Danny T Quah⁽¹⁾ (Centre for Economic Performance, the London School of Economics).

This article is one of an occasional series provided by academics working outside the Bank of England. The views expressed reflect those of the author rather than those of the Bank of England.

In this article Danny T Quah examines how, when an economy grows, its patterns of production and consumption systematically change. He describes one such large-scale evolution, namely, the increasing weightlessness of aggregate output across advanced economies. In all fast-growing successful countries, growth in information technology has contributed positively both to increasing weightlessness and to economic growth. In the sample of countries studied here, the richer the country the higher the contribution to growth of information technology and services; in no country has manufacturing, as traditionally construed, continued to be as important.

Introduction

What happens to the mix of economic activity as developed economies continue to grow? This article presents empirical evidence that shows such economies become increasingly *weightless* over time. By this I mean that greater value, as a fraction of GDP, resides in economic commodities that have little or no physical manifestation. Another description of such structural change is progressive *dematerialisation*.

Examples of weightlessness and dematerialisation are diverse: they range from economic activities such as stocking supermarket shelves and styling haircuts, all the way through financial services and up to telecommunications and providing software products on CD-ROM. Within the diversity of dematerialisation different activities might also have widely differing implications for the ability to sustain economic growth. For example, dematerialisation includes high technology but also low technology activities such as making hotel beds or providing gardening services. The latter might well carry a society through hard times but are unlikely to forge nations into enduring economic powerhouses.

One prominent form of dematerialisation is concentration of activity in information technology (IT). Economists are not all agreed that this matters, or that such change differs from any other kind of macroeconomic transformation. Those who suspect it might be important and different have just begun to study its implications for a range of issues: whether economic growth can be sustained in advanced economies; what might happen to the distribution of income across and within societies; and how trade patterns

and macroeconomic policy must adjust as dematerialisation proceeds.

In assessing the evidence on sectoral change and aggregate growth, this article examines whether dematerialisation and IT will matter increasingly for economic performance and wealth creation.

Such an exercise can refine our understanding of the nature of economic growth. And the analysis has an immediate policy implication. Statistical agencies divide their research resources across a range of activities to build up a composite picture of the economy. Knowing that some sectors are likely to become more important than others can help improve the allocation of those resources. For instance, as the manufacturing sector shrinks as a percentage of GDP and shows behaviour different from those sectors that grow faster (ie, services), the performance of manufacturing will reveal progressively less about the macroeconomy.⁽²⁾

The economic issues

Two aspects suggest that dematerialisation might be macroeconomically important. The first is simply increasing weightlessness deriving from the growth of services—as opposed to, say, manufacturing in particular, or industry in general. The second is dematerialisation deriving from the increasing importance of IT.

These two aspects differ in their economic implications.⁽³⁾ But they are both controversial. Some economists doubt if the basis of a strong, growing economy can be provided by services in general or IT in particular. Some have argued

(1) Director of the National Economic Performance Programme, CEP and Professor of Economics, LSE. The author would like to thank Louise C Keely for help, and the British Academy for financial support. Anonymous referees provided extremely useful comments and suggestions.

(2) For studying aggregate business cycles, this point has been emphasised in Lee (1996).

(3) Quah (May and October 1996) discusses some of those in greater detail.

that weightlessness might be regarded as being without substance and, consequently, without value. Two versions of this view can be distinguished. To the extent that increasing weightlessness means further development of multimedia in entertainment and video games, some consider it to be frivolous at best but actually harmful at worst. Others view increasing weightlessness as irrelevant.

It is useful to say explicitly what I mean by dematerialisation in economic growth, and to consider services and IT separately. I ask below, where in advanced economies does growth in GDP occur?

Nominal GDP—like any other measure of aggregate output that macroeconomists study—represents both value created and that willingly paid for by consumers. If something is valued and marketed then it shows up as part of GDP.

Among economists at least, there should be no controversy over whether IT is what people want or whether multimedia entertainment adds economic value. These should simply be evaluated at market prices and sized up relative to everything else that enters GDP. Weight is irrelevant for economic value; what matters is how large that economic value is.

Examining output through GDP gives a measure of domestic value added. But detail on—for instance—UK spending on US imports has to be obtained from the expenditure measure of GDP. If the typical UK resident had come to depend on IT products—for example, through banking by computer or shopping over the internet—but all those were *imported* IT products from the United States, then little of what really mattered in economic life would show up in UK GDP. Analysing the GDP output measure alone would then underestimate IT's true importance in the UK economy. It is useful, therefore, to look also at the spending side; I will do so below.

Decomposing the United Kingdom's GDP growth: dematerialisation and IT

According to the IMF *Balance of Payments Statistics Yearbook*, in all OECD economies exports of services accounted for more than 10% of total gross exports of goods and services over the period 1990–94. The OECD economies can be split into two groups: first, exporters primarily of goods, for example Canada, Germany and Japan; and second, more diversified exporters, including the United Kingdom, where services amounted to close to 25% or more of total gross exports of goods and services. And for the United Kingdom, of the value added from exports, services accounted for 43% in 1990 (the latest data available).

To begin, consider how GDP in the United Kingdom has evolved: what has contributed how much to the growth of GDP here?

Traditional macroeconomic accounting divides GDP into three principal categories: agriculture, industry, and services.

- *Agriculture* includes agricultural and livestock production and services; fishing; hunting; and logging and forestry.
- *Industry* includes mining and quarrying; manufacturing; construction; and electricity, gas, and water.
- Finally, *services* includes transport, storage, and communications; wholesale and retail trade; banking, insurance, and real estate; ownership of dwellings; public administration and defence; other services; and statistical discrepancies.

The natural step is to identify *services* as the sector where increasing weightlessness matters, and to take *agriculture* and *industry* as being the opposite.

But, for studying the issues of interest here, this partitioning is not ideal. IT does not show up neatly on only one side of either manufacturing or services. It comprises semiconductors, computers, software, telecommunications, and IT services (see, eg, OECD). Thus, IT straddles, among other things, manufacturing under *industry*, and transport, storage, and communications under *services*.

Production of semiconductors *is* manufacturing. But, semiconductors are also prime examples of dematerialisation. The location of their manufacture is unimportant because transportation costs are trivial (see, eg, the anecdotal evidence in Quah, May and October 1996). Semiconductor value derives from a logic configuration that sits on top of an ultra-thin wafer of silicon; the physical material, to all intents and purposes, is worthless. Yet, semiconductor production is recorded as manufacturing—just as are making steel cranes and railway sleepers.

For analysing dematerialisation, difficulties remain even at more micro levels of disaggregation. The International Standard Industrial Classification (ISIC) scheme partitions all economic activity into categories—the greater the number of digits in the ISIC code, the finer the disaggregation. At the four-digit level, the category ISIC 3825—office, computing, and accounting equipment manufacture—includes not only computers and peripherals, but also typewriters, cash registers, and simple accounting machines. Electronic components—a key IT ingredient—is placed not with computers, but elsewhere in ISIC 3832 (radio, TV, and communication equipment manufacture) instead, which then includes many other things unrelated to IT.

Thus, the *agriculture, industry* and *services* split provides little sharp insight on GDP dematerialisation and IT. Nevertheless, such a division is the only one available for a wide range of countries at differing levels of development. Therefore, it is the one I use. Such a division, while crude, shows general tendencies reasonably well. And, the methodology I describe will readily apply as more apposite data become available: I use this fact below when I combine IT and GDP data from different sources.

Let $Y(t)$ denote the time t flow of GDP. Index by j an arbitrary partitioning of the economy—say into the three categories *agriculture*, *industry* and *services*—so that:

$$Y = \sum_j Y_j \quad (1)$$

where Y_j denotes GDP in category j . Differentiate both sides of equation (1) with respect to time t , and use dots to denote time derivatives. Then, normalising by Y , equation (1) becomes:

$$\dot{Y}/Y = \sum_j \dot{Y}_j/Y = \sum_j \left(\dot{Y}_j/Y_j \right) \times \left(Y_j/Y \right) \quad (2)$$

Define g to be the proportional growth rate of Y and g_j that of Y_j . Let s_j be sector share Y_j/Y . Then equation (2) can be rewritten as

$$g = \sum_j g_j s_j = \sum_j \gamma_j \quad \text{with } \gamma_j = g_j \times s_j \quad (3)$$

Equation (3) decomposes GDP growth into contributions due to the different sectors. Provided that g is not zero, equation (3) then says $\bullet_j \gamma_j/g = 1$, so that γ_j/g is sector j 's relative contribution to total GDP growth.⁽¹⁾

Each γ_j is the product of the sector's share in total GDP with that sector's proportional growth rate. Thus, in general, sector j will show a high contribution to growth only when both its share s_j and its growth rate g_j are high. Growth rates and sector shares g , g_j , and s_j will typically all change through time; but, at each moment in time, equation (3) will hold.

Since the split of the economy into categories in (1) is arbitrary, a sector's contribution to GDP growth can always be estimated by $g_j \times s_j$, regardless of whether complete data exist on all remaining sectors. When the data are exhaustive, then the sector contributions sum to 1, but that is the only additional insight from having the entirety of sectors.

Using the World Bank's 1996 *World Tables*, I calculated the decomposition (3) for UK GDP measured in nominal US dollars at prevailing exchange rates. Use of nominal GDP data does mean that the results are subject to a couple of caveats. When considering the contribution of each sector it might be more informative to look at the real contribution—excluding the effect of different inflation rates (or even industry specific purchasing power parity exchange rates) between sectors. But this breakdown is difficult to achieve accurately if price measures do not adequately account for changes in quality: this may be important for computers where prices are measured per computer rather than per unit of computing power. The importance of this is uncertain and it is left to further research to consider these issues.

Table A shows the nominal GDP decomposition for five-year intervals from 1972 for the *agriculture/industry/services* split, but then also peels out the *manufacturing* component in industry.

Table A
Decompositions of UK GDP growth over five-year intervals

Time span	γ/g					IT (a)
	g	Agr.	Ind.	(Mnf.)	Svc.	
1972–77	9.8	2.2	39.7	(25.5)	58.1	
1977–82	13.1	2.0	42.1	(20.7)	55.8	
1982–87	7.2	1.0	26.9	(22.6)	72.1	
1987–92	9.0	1.4	21.3	(15.6)	77.3	1.1

(a) The IT figure is for 1987–94.

In each row, the figures under Agr., Ind. and Svc. sum to 100, subject to rounding error.

Next, I used data from the OECD 1995 *Information Technology Outlook* to calculate the contribution of IT to GDP growth, although only from 1987. Unlike the value-added calculation given in the *agriculture/industry/services* split, IT contribution means spending on IT, not production. Therefore, division (1) is used now with Y as total spending, rather than total production. Nevertheless, the same principle applies.

Table A shows that *services*' contribution to UK growth rose from twice *manufacturing*'s in 1972–77 to more than five times the latter by 1987–92. Over the same period, *services*' growth contribution rose from one and a half times *industry*'s to almost four times the latter. This increase seems dramatic, but even by the 1970s, UK growth was already more than half due to *services* alone. Regardless of whether historical overall growth is considered strong or weak, it is unambiguous that the *services* sector has contributed substantially and increasingly to UK wealth creation.

The IT figure of only 1.1% for 1987–92 is, by comparison, tiny—smaller even than *agriculture*.

Can *services*' γ/g —contribution to GDP growth—continue to be so much larger than all the other sectors'? If the economy undergoes *balanced growth*—when all sectors grow at the same rate and thus sector shares are constant—then γ_j/g ratios simply reflect those different (constant) shares.⁽²⁾

Thus, in balanced growth, our observations on the relative contributions in Table A apply not just to growth dynamics, but to level shares as well. Using Table A then as a prediction on long-run, steady-state growth, the overwhelming importance of *services* is obvious.

Of course, most economies need not be undergoing balanced growth just yet. Some sectors might grow much faster than others and will thus be increasing their share of total GDP. What then can we learn from the calculations underlying

(1) Even if g is negative with some γ_j positive, so that $\gamma_j/g < 0$, the interpretation still goes through: sector j restrained the economy from wherever it would have otherwise gone.

(2) To see this, notice that equation (3) with $g_j = g$ for all j gives $\gamma_j = g_j s_j = g s_j \Rightarrow \gamma_j/g = s_j$.

Table A? By definition, sector j 's share is

$$s_j = Y_j/Y$$

Taking proportional growth rates on both sides gives

$$\begin{aligned} \dot{s}/s_j &= g_j - g \\ &= (\gamma_j/s_j) - g \\ &= [\gamma_j/g - s_j] \times (g/s_j) \quad (4) \end{aligned}$$

Equation (4) says that the sector share's proportional growth rate depends on how large that sector share already is compared to the overall growth rate. Of course, since sector shares have to lie between 0 and 1, this growth cannot continue indefinitely, but away from those boundaries, equation (4) gives a rough guide as to how sector shares will evolve.

In Table B I present growth dynamics for the *services*, *manufacturing*, and IT sector shares. Within each bloc, column s shows percentage share; column γ/g shows contribution to total growth; and column \dot{s}/s shows how fast the sector share is growing. I emphasised above that these

Table B
Changes in UK sector shares: services, manufacturing, and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	γ/g	\dot{s}/s	s	γ/g	\dot{s}/s	s	γ/g	\dot{s}/s
1972-77	54.7	58.1	0.6	30.4	25.5	-1.6			
1977-82	54.9	55.8	0.2	27.8	20.7	-3.4			
1982-87	57.5	72.0	1.8	25.0	22.7	-0.7			
1987-92	62.8	77.3	2.1	23.6	15.6	-3.1	2.5	1.1	-5.2

A sector is expanding when its growth contribution γ/g exceeds its share s . The sector growth rate $\dot{s}/s = [\gamma/g - s](g/s)$ is given per cent per year; ratios (s , γ/g) are in percentage points.

(a) The IT figures are for 1987-94.

figures can show no more than rough tendencies; nevertheless, it is useful to provide an interpretation for them. Thus, take the row for 1987-92: *services*' sector share is growing at 2% per year. If this continues, then *services*' current 60% share will become 90% in 20 years.⁽¹⁾ By contrast, the *manufacturing* share continues to decline: with a rate of change of -3% the 20% share will decline to 15% in ten years.

Interestingly, although in absolute figures IT spending is increasing, its share of the total is *declining*: the growth contribution γ/g is less than s . Moreover, this low growth contribution comes from IT's relatively low growth rate, not a low sector share. The 2.5% share in the United Kingdom is high compared with many other countries. The United States has about the same share, but one that is rising rather than falling. Two interpretations are possible: first, IT is just not an important part of the burgeoning dematerialised economic activity in the United Kingdom. I think this implausible. Second, the United Kingdom is not yet saturated with IT, and much more room remains for continued expansion. Given the results for the

United States below, this possibility needs to be investigated further. More finely disaggregated and timely data would help here.

I now turn to the growth experiences of other economies, but it is useful to summarise the lessons thus far. Tables A and B have provided a picture of the UK economy where the performance of the weightless *services* sector has been the outstanding characteristic in aggregate economic growth. The sector is not only large, but continues to outpace all others. If the current trend were to continue, within a decade *manufacturing* would contribute no more than one tenth of the total value generated in the economy.

Decomposing economic growth across countries

Tables C.1, C.2, C.3, C.4 and C.5 provide results for a range of countries with differing growth experiences—the United States, Singapore, Korea, Pakistan, and the Philippines, respectively: they present the same growth decompositions as given for the United Kingdom in Table A. Similarly, Tables D.1, D.2, D.3, D.4 and D.5 present sector share dynamics for the different countries, analogous to Table B. (For Pakistan and the Philippines, I have been unable to obtain IT numbers.)

On Table C.1 we see that the United States is an economy where the *services* sector growth contribution has risen, continually, from under 60% in 1972-77 to over 80% in 1987-92. These contributions exceed their UK counterparts. At the estimated 2% annual rate of decrease (Table D.1, 1987-92) *manufacturing*'s share of 20% would decline to 15% in ten years. In the United States the IT share was only 2.4% of GDP by the end of the 1980s, marginally lower than in the United Kingdom. But, unlike the United Kingdom, the IT sector share is estimated to be growing at over 2% per year. This figure though seems quite small: if maintained, it implies only a doubling in 30 years.

Singapore is widely regarded as a successful, fast-growing economy. The *services* sector has, throughout the sample, accounted for over 60% of GDP growth. However, that contribution has remained roughly constant, unlike the United States and the United Kingdom where it has risen sharply. In Singapore, *manufacturing*'s growth contribution has consistently remained more than one quarter; and its share in GDP began to decline only towards the end of the sample. Singapore's recent massive IT push (eg, Slavin 1996) has not yet manifested in these data: the IT share actually declined over 1987-94.

Korea resembles Singapore in that *manufacturing* remains important for growth, but the share declines towards the end of the sample. On the other hand, Korea has increased its IT share, but the figure of only 0.7% in 1987 is surprisingly small—as is IT's growth contribution of only 0.8% over 1987-92. Although *services*' growth contribution in Korea

(1) The ratio of 90 to 60 is 1.5, whose natural log is 0.4; dividing this by the growth rate gives time in years needed to make the transition.

Table C.1
Decompositions of US GDP growth over five-year intervals

Per cent per year

Time span	g	$\%g$			Svc.	IT (a)
		Agr.	Ind.	(Mnf.)		
1972–77	10.3	-5.0	48.3	(29.4)	56.8	
1977–82	9.8	2.1	30.3	(15.6)	67.6	
1982–87	7.4	0.8	22.1	(17.2)	77.1	
1987–92	5.9	1.8	17.3	(13.0)	81.0	3.3

In each row, the figures under Agr., Ind., and Svc. sum to 100 (subject to rounding error).

(a) The IT figure is for 1987–94.

Table C.2
Decompositions of Singapore GDP growth over five-year intervals

Per cent per year

Time span	g	$\%g$			Svc.	IT (a)
		Agr.	Ind.	(Mnf.)		
1972–77	17.7	1.6	35.0	(27.9)	63.4	
1977–82	18.4	0.5	39.4	(27.0)	60.1	
1982–87	5.8	-1.1	40.0	(37.4)	61.1	
1987–92	19.6	-0.0	35.0	(26.2)	65.0	1.7

In each row, the figures under Agr., Ind., and Svc. sum to 100 (subject to rounding error).

(a) The IT figure is for 1987–94.

Table C.3
Decomposition of Korea GDP growth over five-year intervals

Per cent per year

Time span	g	$\%g$			Svc.	IT (a)
		Agr.	Ind.	(Mnf.)		
1972–77	28.1	20.3	39.4	(30.8)	40.4	
1977–82	15.3	6.7	43.7	(29.1)	49.6	
1982–87	12.5	5.0	47.3	(35.6)	47.8	
1987–92	17.7	5.3	45.4	(25.2)	49.2	0.8

In each row, the figures under Agr., Ind., and Svc. sum to 100 (subject to rounding error).

(a) The IT figure is for 1987–94.

Table C.4
Decompositions of Pakistan GDP growth over five-year intervals

Per cent per year

Time span	g	$\%g$			Svc.	IT (a)
		Agr.	Ind.	(Mnf.)		
1972–77	10.2	25.0	25.4	(14.1)	49.6	
1977–82	15.0	29.9	22.2	(15.5)	47.9	
1982–87	1.6	-35.3	43.8	(34.4)	91.5	
1987–92	7.7	26.0	28.8	(18.9)	45.2	n.a.

In each row, the figures under Agr., Ind., and Svc. sum to 100 (subject to rounding error).

(a) No IT data were available.

Table C.5
Decompositions of Philippines GDP growth over five-year intervals

Per cent per year

Time span	g	$\%g$			Svc.	IT (a)
		Agr.	Ind.	(Mnf.)		
1972–77	19.6	29.0	38.4	(24.7)	32.6	
1977–82	13.6	17.4	41.9	(24.9)	40.7	
1982–87	-2.2	18.0	75.5	(27.1)	6.4	
1987–92	9.8	17.6	30.6	(23.4)	51.7	n.a.

In each row, the figures under Agr., Ind., and Svc. sum to 100 (subject to rounding error).

(a) No IT data were available.

Table D.1
Changes in US sector shares: services, manufacturing, and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s
1972–77	62.8	56.8	-1.0	24.3	29.4	2.2			
1977–82	63.7	67.6	0.6	22.5	15.6	-3.0			
1982–87	66.8	77.1	1.1	20.2	17.2	-1.1			
1987–92	69.5	81.0	1.0	19.2	13.0	-1.9	2.4	3.3	2.2

A sector is expanding when its growth contribution $\%g$ exceeds its share s . The sector growth rate $\dot{s}/s = [\%g - s](g/s)$ is given per cent per year; ratios (s , $\%g$) are in percentage points.

(a) The IT figures are for 1987–94.

Table D.2
Changes in Singapore sector shares: services, manufacturing and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s
1972–77	64.2	63.4	-0.2	24.0	27.0	2.2			
1977–82	62.4	60.1	-0.7	26.8	27.0	0.1			
1982–87	61.6	61.1	-0.0	25.4	37.4	2.7			
1987–92	61.0	65.0	1.3	28.0	26.2	-1.3	1.9	1.7	-2.1

A sector is expanding when its growth contribution $\%g$ exceeds its share s . The sector growth rate $\dot{s}/s = [\%g - s](g/s)$ is given per cent per year; ratios (s , $\%g$) are in percentage points.

(a) The IT figures are for 1987–94.

Table D.3
Changes in Korea sector shares: services, manufacturing, and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s
1972–77	43.3	40.4	-1.9	25.7	30.8	5.6			
1977–82	43.7	49.6	2.1	29.9	35.6	2.4			
1982–87	46.3	47.8	0.4	29.9	35.6	2.4			
1987–92	47.5	49.2	0.7	30.0	25.2	-2.8	0.74	0.75	0.4

A sector is expanding when its growth contribution $\%g$ exceeds its share s . The sector growth rate $\dot{s}/s = [\%g - s](g/s)$ is given per cent per year; ratios (s , $\%g$) are in percentage points.

(a) The IT figures are for 1987–94.

Table D.4
Changes in Pakistan sector shares: services, manufacturing and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s
1972–77	43.4	49.6	1.4	15.3	15.5	0.2			
1977–82	45.8	47.6	0.7	15.2	15.5	0.2			
1982–87	48.5	91.5	1.4	15.9	34.4	1.9			
1987–92	49.0	45.2	-0.6	17.0	19.0	0.9	n.a.		

A sector is expanding when its growth contribution $\%g$ exceeds its share s . The sector growth rate $\dot{s}/s = [\%g - s](g/s)$ is given per cent per year ratios (s , $\%g$) are in percentage points.

(a) No IT data were available.

Table D.5
Changes in Philippines sector shares: services, manufacturing and IT

Per cent per year

	Svc.			Mnf.			IT (a)		
	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s	s	$\%g$	\dot{s}/s
1972–77	35.4	32.6	-1.6	25.9	24.7	-0.9			
1977–82	36.0	40.7	1.8	25.5	24.9	-0.3			
1982–87	39.5	6.4	1.9	24.8	27.1	-0.2			
1987–92	43.3	51.7	1.9	25.0	23.4	-0.6	n.a.		

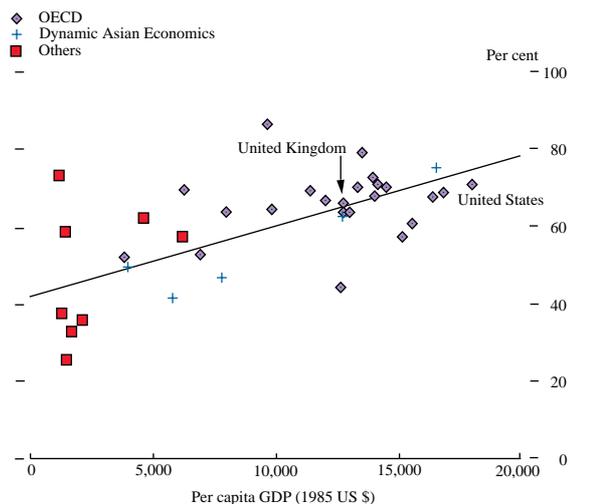
A sector is expanding when its growth contribution $\%g$ exceeds its share s . The sector growth rate $\dot{s}/s = [\%g - s](g/s)$ is given per cent per year ratios (s , $\%g$) are in percentage points.

(a) No IT data were available.

increased sharply from 1977 to 1982 (40% to 50%), that figure has since remained roughly constant.

Finally, turn to Pakistan and the Philippines.⁽¹⁾ The patterns of change here are less clear-cut. In Pakistan, services have always contributed more than 40% to GDP growth, but manufacturing continues to increase its share of GDP. Growth patterns show little stability in the Philippines, but manufacturing has consistently declined.

Chart 1
Contribution of services to GDP growth plotted against 1992 per capita GDP



I now expand the sample to include all the other OECD economies, all Dynamic Asian Economies (DAEs), and a selection of others. For these countries, Charts 1 and 2 plot the growth contributions of *services* and IT against per capita incomes. For completeness Chart 3 also gives the analogous plot for *manufacturing's* growth contribution.⁽²⁾

The figures yield a number of interesting conclusions. First, for all the relations depicted here, the distinction between OECD and non-OECD membership does not seem to matter. Once one allows for per capita GDP, the respective scatters of OECD and non-OECD points are not out of line with each other. Although in 1994, 93% of the IT market of US \$431 billion was concentrated in the OECD area (with 80% in just the United States, Japan, Germany, France, and the United Kingdom), that concentration might reflect only the pattern of income distribution across countries.⁽³⁾

Second, the slope of the scatter of points in Chart 1 and Chart 2 is positive, while that in Chart 3 is negative. Across the sample, richer countries are those that have higher contributions to economic growth from *services* and from

Chart 2
Contribution of IT to GDP growth plotted against 1992 per capita GDP

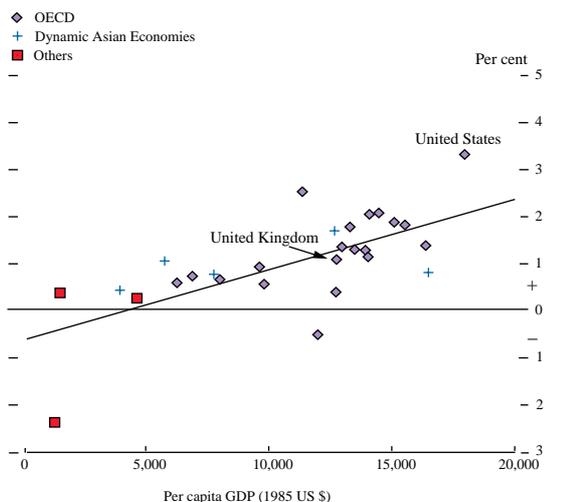
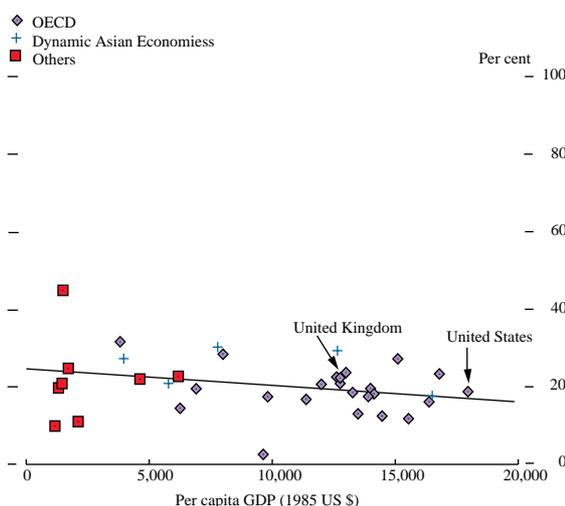


Chart 3
Contribution of manufacturing to GDP growth plotted against 1992 per capita GDP



IT; only the relatively poorer economies continue to see significant contributions from *manufacturing*.

The third conclusion is that for growth, the *services* sector is the most important in all advanced economies. In economies with per capita GDP of at least US \$5,000, the *services* sector accounted for more than 40% of that economy's growth performance. In 80% of economies having per capita GDP of at least US \$10,000, the manufacturing sector contributes less than 20% of that economy's growth performance.

Finally, the United States is distinguished in having experienced the highest contribution from IT to aggregate growth.

(1) Fairly or unfairly, these are frequently singled out (by, among others, Lucas (1993) and the World Bank) for comparison with Korea and other successful fast-growing economies.

(2) Per capita incomes are taken as the 1992 values of per capita GDP, in 1985 US dollars, calculated using a chain index (Summers and Heston (1991) and updates).

(3) In Chart 2 the two highest points are the United States and New Zealand. The two points that show negative IT contribution are India (-2.4%) and Finland (-0.5%). From 1987 to 1994, India actually experienced *negative* GDP growth, while IT growth was 11%. In this case, how to interpret my measure of IT's contribution to growth is subtle, but I have decided to maintain the convention earlier described. Over this period, Finland showed a slight negative decline in IT spending measured in current exchange rates, as used throughout this paper. Using purchasing power parity corrections, this would have showed a slight increase instead. Either way, however, the magnitude of its contribution to growth is small.

What do these estimates tell us about the United Kingdom's specialisation in services? Advanced economies all have the *services* sector contributing the most to growth. The richer the economy, the more it relies on the *services* sector, and the less on *industry, manufacturing, or agriculture*.

Conclusion

This article has investigated growth facts on GDP's increasing weightlessness—through dematerialisation in general and IT in particular.

Although the picture varies across countries, several generalisations are apparent. First, the *services* sector is the most important in all advanced economies. In richer economies (those with per capita GDP of at least US \$5,000), the *services* contribution to growth is always at least 40%. In almost all advanced economies it is *services* which figure most prominently in growth.

Second, while increasing dematerialisation matters, it is much less clear that a great deal of that has, thus far, arisen from IT. Successful economies like the United States and Korea do show a rising emphasis on IT, but other successful ones, like Singapore, do not—at least not dramatically.

Circumspection is called for in drawing implications from this last observation. The United States and Korea might be leading the way for all other economies, while Singapore might simply show the potential for greater future growth and IT concentration.

The United Kingdom is one economy that has had its *services* sector both contributing strongly to GDP growth and continuing to increase rapidly in share. But, here, the transition to an IT emphasis remains far from obvious. Again, this might just mean that the scope for high IT growth in the United Kingdom remains correspondingly large.

Third, increasing weightlessness and dematerialisation in economic growth take many different forms. To see whether IT has become more important in overall economic activity, it is far from ideal to look simply at the national income accounting distinction between *manufacturing* and *services*. IT involves elements of both, and looking at just the standard classification categories can mislead. While already-developed economies like the United Kingdom and the United States almost uniformly show continuing decline in *manufacturing*, the shift to the *services* account does not reveal whether IT is becoming more or less important as a fraction of GDP: revisions to the standard industrial classification categories might be called for, eventually. New data are critical for further investigation. For the United Kingdom, considerable additional insight might result if finer statistical details on this split were available.

One overarching conclusion from this analysis is that the term 'industrialised countries' no longer carries any resonance: now, no advanced and growing country is dependent on production industries. But, whether it is IT and only IT that will subsequently be the main engine of growth is not yet apparent from the numbers. The United States leads the way, but even there IT has made only a 3% contribution to GDP growth, while the increase in IT share in GDP is, for the time being, no more than 2% per year.

One goal of this article was to stimulate discussion on the issue of changing industrial structures in economic growth. The financial sector is a large part of the weightless economy, and this article has said little about it. Implications for financial and monetary policy, appropriate emphasis on the manufacturing sector, the importance of the exchange rate for the geographical location of economic activity—all might follow from better understanding and more precise measurement of the effects described above. My calculations above made simplifying assumptions, and left open a number of other empirical issues that will lead to a programme of further work.

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Monetary policy implementation in EMU—a Bank of England perspective on the EMI's proposals

This article, by David Rule of the Bank's Gilt-Edged and Money Markets Division, summarises and explains the European Monetary Institute's (EMI) proposed operational framework for the European System of Central Banks (ESCB)⁽¹⁾ to conduct a single monetary policy in Stage 3 of Economic and Monetary Union (EMU). The framework would apply in the United Kingdom from 1 January 1999 if the United Kingdom fulfilled the necessary conditions to adopt the euro and the UK Government and Parliament decided to move to Stage 3. The article sets out the areas where agreement has been reached between EU central banks and gives the Bank of England's views on the issues that remain to be settled by the European Central Bank (ECB) after it becomes operational.

This article concentrates on the *implementation* rather than the *determination* of monetary policy. The ECB will have a primary objective of maintaining price stability but the EMI has left open at this stage to what extent its monetary policy strategy will be mainly one of monetary targeting or direct inflation targeting.⁽²⁾ Whatever the precise details of its strategy, however, the operational objective of the ECB will, under normal circumstances, be a short-term interest rate. This article discusses the instruments and procedures that will form the ESCB's armoury in pursuit of this operational target.

The timetable for the EMI's preparatory work on the operational framework

The final decisions on the operational framework will ultimately be taken by the Governing Council of the ECB. This cannot happen until the ECB is set up, which, according to the EC Treaty, will follow the decision in early 1998 on which Member States will initially comprise the euro area. The preparatory work of the EMI will greatly influence the choices the ECB has available to it, however. For this reason, many features of the operational framework have, for practical purposes, already been settled. The detailed negotiations continue to take place in EMI working groups in which all national central banks, including the Bank of England, are actively involved.

The *conceptual phase* of the preparations began soon after the EMI's inception in 1994 and was completed by the end of 1996, in accordance with Article 109f(3) of the Treaty which requires the EMI to specify the regulatory, organisational and logistical framework necessary for the ESCB to perform its tasks in the third stage of EMU by 31 December 1996. This was set out in the EMI's publication, 'The Single Monetary Policy in Stage 3: specification of the operational framework', (the 'framework document') published on 10 January 1997.

The EMI and national central banks are currently engaged in a second phase of preparations in which the detailed *blueprints* and *specifications* of the operational framework will be drawn up. This work will be completed by mid-1997. An *implementation* and *development phase* will then follow which must be finished by mid-1998 to allow six months of *testing* and *simulation* before Stage 3 begins on 1 January 1999.

The functions required of the operational framework

The 'framework document' states that the operational target of the ESCB will normally be a short-term interest rate. The primary function of the operational framework will therefore be to steer money-market interest rates efficiently and to give clear signals of official expectations about the future path of interest rates and thus the general stance of monetary policy.

The EMI's preparations have assumed that the ESCB will prefer to set rates by acting as the marginal supplier of funds rather than the marginal taker of funds. For this reason, a second function of the operational framework will be to enable the ESCB to manage the structural liquidity position of the financial markets *vis-à-vis* the ESCB to ensure the ESCB's counterparties are normally short of funds over the maturity of the ESCB's main refinancing operations (which will be two weeks).

The preparations have also taken into account two subsidiary aims: to encourage efficient money markets in the euro to develop and thus enable the ESCB to extract information (for example, about expectations of future changes in interest rates) from market developments, and to contribute to the smooth functioning of payment systems in the euro area.

Finally, the EMI has also left open the possibility that the ECB will seek to use unremunerated reserve requirements to

(1) The ESCB will comprise the ECB and the participating national central banks. Its tasks are defined in Article 105 of the EC Treaty.

(2) In practice, there are many common elements to the way in which individual countries pursue these respective strategies and a good deal of overlap between them.

increase the sensitivity of money demand to changes in interest rates.

Factors that influenced the choice of operational framework

Practical constraints

A major, and in many ways unique, problem in designing this operational framework is the limit to what is known about the prospective euro area. Unlike an existing monetary union, there is no experience or statistical data on which to draw and nobody really knows how the euro money markets will develop. Of course, it is possible to make broad assumptions based on the characteristics of existing money markets in individual EU states but these cannot take into account fully the behavioural changes that would follow EMU. At this stage, even the participating countries are not known.

For this reason, the EMI's preparations have assumed that the ESCB will need an operational framework with a high degree of flexibility. For example, the underlying liquidity position of the banking sector *vis-à-vis* the ESCB *prior to any official operations* cannot be predicted with any degree of accuracy at this stage and may remain difficult to estimate nearer the time. Among other factors, it will depend on the demand for euro banknotes, which, in turn, may vary according to the identity of the participants because the use of cash differs greatly between EU states. The preparations have assumed that the ESCB will need to have available the technical instruments and procedures to both extract funds from and inject funds into the money markets at different maturities to create the desired structural liquidity position.

The flows of funds in the euro money markets are also very difficult to predict. The law of large numbers would suggest that net flows will be smaller relative to gross flows in a larger monetary union and therefore short-term money-market volatility should be lower than in existing national markets. At least in the early stages of Stage 3, however, it is possible that flows will be unpredictable and short-term interest rates might be volatile unless the ESCB's operational framework has the flexibility to supply or demand funds quickly. This risk will be greater if the integration of national money markets remains imperfect initially and a seamless euro money market (to bring together those that are long and short of funds) takes time to develop.

Principles

The EMI Council adopted eight principles to guide the choice of operating framework. These reflect the provisions of the Treaty as well as the Statute of the ESCB. They also indicate the issues inherent in building a monetary union between sovereign states and in many cases the EMI's preparations have needed to weigh the dictates of one

principle against another to find an acceptably balanced solution. The first principle is that of:

- operational efficiency in performing the functions described above.

Four of the other principles follow from the need for operational efficiency. These are:

- conformity with the decision-making framework of the ESCB, which requires that the Governing Council of the ECB at the centre should be in a position to control the monetary policy stance at all times;
- consistency with an open market economy based on free competition and favouring an efficient allocation of resources;
- simplicity, transparency and cost-efficiency; and
- harmonisation of operations to the extent necessary to ensure a single monetary policy stance, to avoid giving any opportunities for arbitrage between the operations of different parts of the ESCB and to treat counterparties equally throughout the euro area.

The remaining three principles reflect the origins of EMU as a monetary union between sovereign states in a single market, but with well-established national currencies, policy and operational frameworks and money markets. These are:

- decentralisation of operations to the national central banks as far as this is possible and appropriate;
- equal treatment of all financial institutions that have access to the ESCB's facilities throughout the euro area; and
- to seek continuity with the existing infrastructure and practices of national central banks and to prevent unnecessary disruption of existing markets *provided* this does not conflict with the other guiding principles.

An analysis of the EMI's proposals and the decisions that remain for the ECB

It is possible to analyse the proposed operational framework as a product of three debates that have their origins in the objectives, practical constraints and principles set out above. The first of these debates is:

To what extent should the ESCB supply liquidity to markets through open market operations or refinance credit institutions⁽¹⁾ directly?

To put this question another way, should the ESCB meet only the *net* liquidity needs of the financial system and rely on markets to distribute the funds or should it provide liquidity

(1) The term 'credit institutions' is used for convenience even though access to ESCB operations may extend to a slightly wider group of 'monetary and financial institutions'.

to institutions individually and thus, in aggregate, supply closer to the *gross* liquidity needs of the system? This debate has largely been resolved in favour of the first of these alternatives. The Bank of England strongly supports the emphasis placed on open market operations in the EMI's proposals.

Liquidity providing operations

Liquidity providing operations will be conducted predominantly through tenders for counterparties to obtain funds by repoing securities to the national central banks. The option to obtain funds directly will also be available by way of averaging of reserve requirements (if these are applied) and from an overnight lending facility. However, neither facility will offer preferential financing to particular credit institutions or classes of credit institutions. Indeed, the rate on borrowing under the lending facility will normally exceed market rates. For this reason, institutions will almost always have an incentive to obtain funds in the markets.

The ESCB's regular *main refinancing operations* will be two-week repos allocated weekly by fixed-rate tenders. These market-oriented operations will establish the ECB's headline dealing rate and it will use them to influence directly the short-term interest rates that constitute its operational objective. They will also supply the bulk of the financial market's demand for liquid funds. For these reasons, the weekly tender will be the most important and predominant part of the ESCB's operational framework. The Bank welcomes this outcome and believes that the ESCB should be able to rely increasingly on these operations as an efficient and integrated euro money market develops.

A smaller proportion of the market's need for liquidity will be provided by regular *longer-term refinancing operations*. These will be three-month repos allocated through monthly variable rate tenders. Because the ESCB will ask counterparties to bid prices as well as quantities, the rate accepted will have no policy significance. On the basis that the ESCB will be a rate-taker and no subsidy is involved, the Bank of England was prepared to support these operations on a limited scale to minimise disruption of existing practices in some other countries.

The EMI's preparations have taken account of the perceived need (discussed above) for the operational framework to have flexibility against liquidity shocks. The ESCB will have the capability to undertake *ad hoc* open market operations to respond quickly to unexpected fluctuations in the net liquidity of the system. The armoury of these *fine tuning operations* will include short-term repos, short-term deposits and foreign exchange swaps, usually allocated by tenders to a smaller group of market counterparties. In a decentralised system, however, fine tuning may be insufficient to cushion the impact of shocks on individual credit institutions. The introduction of TARGET, and national real time gross settlement (RTGS) systems in those states that

do not already have them, will also affect payment flows. The EMI's preparations will therefore give credit institutions two options to manage their liquidity directly with ESCB.

First, if reserve requirements are applied, they will be calculated as an average end-of-day balance over a monthly maintenance period rather than having to be held continuously. This should mean that unexpected flows of funds impose costs on credit institutions only at the end of a maintenance period. At other times, the credit institution will be able to offset the unexpected change in its reserve balance with the ESCB by adjusting its balances on subsequent days. An important proviso is that the EMI is not preparing for the ESCB to offer reserve overdrafts. For this reason, averaging will not give credit institutions the flexibility to handle unexpected outflows greater than the balance on their reserve account (they would need to use the lending facility described below and incur a higher interest cost). Its practical importance in credit institutions' liquidity management will therefore depend upon the size of any reserve requirements.

The ESCB will offer credit institutions two overnight standing facilities: a deposit facility for unexpected surpluses and a marginal lending facility for unexpected shortfalls. If reserve requirements are applied, these will be used to cope with unexpected flows that are too large to be absorbed by averaging, or that occur at the end of a maintenance period. If reserve requirements are not applied, the standing facilities are likely to be used more often, although the ESCB would also engage in more frequent fine tuning operations. Credit institutions will be able to use these facilities at their discretion throughout the day and, in addition, overnight debit balances with the ESCB will be treated as automatic recourse to the marginal lending facility. However both facilities will be at unattractive rates, so credit institutions will invariably have an incentive to manage their liquidity in the euro money markets rather than directly with the ESCB. The two rates will, in effect, set a 'corridor' for overnight market rates.

Liquidity absorbing operations

The EMI's preparations for the ESCB's liquidity absorbing operations leave more for the ECB to decide than in the case of the more important liquidity providing operations. Because of the assumption that the ECB will prefer to operate as a marginal supplier of funds in its main weekly tenders, such operations play only a technical role in the proposed operational framework. They are designed as *structural operations* intended to influence the overall liquidity position of the market rather than achieve interest rate policy objectives directly.

It could be the case that liquidity absorbing operations prove necessary to create or enlarge a liquidity shortage in the money markets. If that is so, the Bank of England sees advantage in the ESCB draining the funds from the markets by issuing ESCB debt certificates. This would be consistent

with the emphasis on supplying funds to markets on the other side of the ESCB's balance sheet. The EMI's preparations include this possibility. The alternative would be to use reserve requirements to bring about a liquidity shortage. Although this need not impose a tax on credit institutions if the reserves were fully remunerated, the Bank of England still opposes the proposal on grounds of efficiency. Similar arguments apply, as for liquidity providing operations. Here, the debate is whether to drain the net surplus of funds from the financial system and allow the market to distribute the remaining funds, or to take the *gross* surplus from individual credit institutions by way of reserve requirements. The Bank will argue that the ECB should adopt the first approach.

A few of the key decisions remain for the ECB to make, although the EMI's preparations give a good impression of the overall shape of the operational framework. The width of the corridor between the overnight deposit rate and lending rate will determine the extent of the incentive for credit institutions to manage their liquidity in money markets rather than directly with the ESCB. Perhaps still more important, the size and remuneration of reserve requirements will set the scope for averaging as a means of liquidity management and also influence whether or not the ESCB will need to issue debt certificates.

If the United Kingdom were to participate in EMU, the Bank of England would argue for a relatively wide interest rate corridor and ideally for zero (or, at least, low and fully remunerated) reserve requirements. This outcome would promote deep and efficient euro money markets. Credit institutions would then be able (and have good incentives) to manage their liquidity in markets rather than directly with the ESCB. The efficiency of the ESCB's operations, meanwhile, would be maximised because it would be supplying (demanding) only the net liquidity needs (surpluses) of the financial system.

Eligible assets

The debate between operating in markets and refinancing banks directly extends to the nature of the paper the ESCB will accept in its liquidity providing operations and the counterparties that will have access to its operations. Again the Bank of England welcomes the thrust of the EMI proposals for the ESCB to accept a uniform (Tier 1) list of public sector and high-quality private sector assets and to have a wide range of counterparties. It favours as broad a definition of counterparties and eligible assets as is compatible with protecting the ESCB against risk. This would ensure there is a sufficient supply of collateral and level of trading to allow the money markets in which the ESCB will intervene to become deep and liquid.

As regards eligible paper, the Treaty requires the ESCB to lend only against adequate collateral, whether this is via repos or on standing facilities. The most important criterion for acceptance is that the paper gives the ESCB protection against risk of loss. Therefore it must be of high credit

quality, initial margin will be taken and the ESCB will need to have a robust legal claim over the assets in the event of a default by the borrower. Beyond these necessary features, however, the market-oriented approach supported by the Bank of England favours a relatively wide and uniform list of marketable paper. The EMI proposals for a Tier 1 list are consistent with this aim (the next section describes the preparations for eligible assets in more detail).

An alternative view is that direct refinancing of credit institutions should have a greater role, perhaps, based on a belief that monetary policy operations should be rooted closely in the domestic real economy. If this is seen as an important objective, eligible paper in liquidity providing operations might be restricted to domestic assets. It would also justify measures to retain the eligibility of particular types of assets closely linked to real economic activity, such as, private sector trade bills or other corporate loans.

The EMI proposals do not favour particular categories of asset on these grounds. They do, however, allow a second (Tier 2) list of paper that is of particular importance to national markets. This will include some of the types of non-marketable asset described above. They also restrict eligible assets to, in the main, domestic assets issued by EEA entities, deposited in the euro area and denominated in euro. Although the Bank of England sees no reason, in principle, to have restrictions of this kind, the supply of eligible domestic assets should be sufficiently large that the efficiency of the ESCB's operations will not be impaired.

Counterparties

The EMI's proposals make clear that the ESCB will use a wide range of counterparties but the detail of exactly how far access to its operations will extend remains to be settled by the ECB. In the market-based approach proposed by the EMI, the ESCB will supply closer to the net than the gross liquidity needs of the financial system and rely on the markets to distribute the money to those that are short of funds. The Bank of England would prefer the ESCB's counterparties to include all the institutions that are most active in the repo and money markets and most likely to distribute the funds efficiently. In practice, this may well include securities houses, as well as credit institutions.

Extending the list of counterparties to institutions not legally subject to reserve requirements, however, would raise questions if reserve requirements were actually imposed. There is a view that the right of access to operations should be limited to those institutions subject to reserve requirements. This is also consistent with the view that monetary policy operations should be used to refinance institutions involved in lending at the 'grass roots' of the economy. The ECB will decide whether the counterparties in open market operations will be restricted to credit institutions or whether other institutions meeting required functional and prudential criteria may be included. The Bank of England's view is that they should.

Where should the ESCB draw the balance between the principles of, on the one hand, harmonisation and, on the other, decentralisation and continuity?

This is the second of the debates and it concerns where the ESCB should lie between two extremes:

- national central banks acting solely as operating arms of the ECB using entirely harmonised instruments and procedures in a fully integrated euro money market; and
- national central banks operating in local money markets using their existing instruments and procedures with harmonisation limited to pursuing the same policy objectives.

The spirit of the EMI's proposals is to seek an operational framework closer to the first of these alternatives. In its proposals for the division of responsibilities between the ECB and the national central banks, although operations will actually be carried out by the national central banks, operational policy decisions will be made centrally by the ECB and procedures will be fully harmonised.⁽¹⁾ In the case of a repo tender, for example, the ECB will decide the timing, amount, rate and terms of the tender and the allotment of funds to bidders (there will be no national quotas). The national central banks will deal with the counterparties (in other words, they will take bids, advance funds and take ('reverse in') the assets) but these procedures will be specified in some detail by the ECB.

The logical counterparts to harmonisation of the ESCB's internal procedures are harmonisation of counterparties and eligible assets and the necessary infrastructure to enable counterparties to mobilise assets and funds throughout the euro area. The EMI's preparations are a big step in this direction, although elements of continuity with existing local markets and practices have been included. The Bank of England welcomes the measures to promote efficient, liquid and integrated euro money markets.

There are a number of examples where harmonisation has been important. In the case of counterparties, for example, eligibility will be based on uniform criteria, meaning national central banks will not be able to exclude counterparties at their discretion. This should help to make local markets more similar and promote integration.

The EMI's proposals for eligible assets also emphasise harmonisation. They distinguish two tiers. The first 'Tier 1' will be fully harmonised and uniform across the euro area, meaning all counterparties will be able to obtain funds from their national central bank against paper on the list, whatever its place of origin within the euro area. This will greatly extend the assets available to counterparties compared to what is taken in current national monetary policy operations and should stimulate an integrated market

in Tier 1 paper. Tier 1 will include debt securities issued by public sector and financially sound private sector entities that are listed, quoted or traded on markets deemed sufficiently liquid by the ECB. The Bank endorses the potential inclusion of private sector assets and the restriction to marketable debt.

The second 'Tier 2' list will comprise assets proposed by national central banks as of particular importance for their financial markets. These need not be marketable but must be shown to be of high credit quality. Short-term loans to companies, for example, may be eligible if the relevant national central bank has the ability to assess and monitor the creditworthiness of the borrower itself. In principle, both Tiers 1 and 2 will qualify for use in all the ESCB's operations across the euro area. In practice, however, non-marketable Tier 2 assets are likely to be held by credit institutions in the country of the national central bank proposing those assets only. This may slow down the development of a single market in eligible paper. The EMI proposals recognise that some countries will need to include non-marketable assets on a Tier 2 list to avoid disruption to their markets. The Bank of England accepts this but would hope that the use of Tier 2 assets can be phased out over time.

The infrastructure needed to integrate euro money markets should also be available. The EMI is developing the TARGET system to connect national RTGS systems throughout the European Union. This will make it possible to transfer funds quickly and securely. Moreover, the EMI is preparing a system to enable counterparties to take funds from one national central bank (NCB 1) against eligible assets deposited with another national central bank (NCB 2). This will involve NCB 2 acting as NCB 1's correspondent and custodian.

The EMI has not made preparations to allow counterparties to deal with national central banks across borders (so-called 'remote access'). This means it is likely that credit institutions will have to participate in open market operations and hold standing facilities with their local national central bank. The impetus towards integration of money markets would probably be stronger with remote access. However, the other steps to promote integration described above are likely to be more important. Moreover, the fact that the EMI is not preparing for remote access does not mean it has been ruled out permanently. Preparations need not involve long lead times and the ECB may well look at the question again.

Do reserve requirements have a useful role to play in monetary policy implementation?

The EMI's preparations will give the ECB the option to impose reserve requirements on credit institutions (and possibly some similar institutions too⁽²⁾). The third debate

(1) It remains to be decided whether the ECB will carry out any operations itself; even if it is decided that it should, the great majority of operations would still be undertaken by the national central banks.

(2) The EMI is studying the possibility of extending the requirement to hold reserve requirements to a broader range of 'monetary and financial institutions' that have liabilities similar to deposits (primarily money-market funds). This would require an amendment to Article 19.1 of the Statute of the ESCB which only empowers the ECB to require credit institutions to hold minimum reserves.

is whether it should make use of them and, if so, how. This is one of the few areas where unanimity has not yet proved possible in discussions between national central banks.

The primary purpose of any reserve requirements would almost certainly be market management. As described above, some see reserve requirements as the most effective way to withdraw liquidity from the market. Others see reserve requirements, combined with averaging, as necessary to give institutions the flexibility to cope with unexpected flows of funds and thus stabilise short-term interest rates. The Bank of England believes that both these objectives can be achieved more efficiently using open market operations (issuing ESCB certificates and fine tuning respectively).

Some see a secondary role for reserve requirements, however, as an operational objective in themselves. On this argument, if reserves are unremunerated (or at sub-market rates) and requirements are linked closely to monetary aggregates, they impose a financial penalty on banks related to their monetary liabilities. The size of this cost is linked directly to the level of market interest rates. Assuming it is passed on to the holders of monetary assets, reserve requirements should increase the interest rate elasticity of money demand. This, in turn, should give greater leverage to changes in official interest rates.

The Bank of England's view is that short-term interest rates are a sufficient and effective operational objective in the implementation of monetary policy. Reserve requirements do not have a useful role in a modern market economy. Imposing what amounts to a tax on monetary liabilities discriminates against credit institutions, would lead to avoidance and disintermediation, and would be likely to distort any relationship between the monetary aggregates and the ultimate objective of price stability.

Whether the ECB sees reserve requirements as a valid way of controlling monetary growth will, however, be important in determining how it applies them, if indeed it decides to impose them. If they are used solely for market management purposes, for example, there is no reason why they should not be fully remunerated at market rates. The liabilities included in the base used to calculate the requirements and the size of the requirement may also depend on the ECB's intentions. A wide base and a low requirement would be the way of imposing reserves for market management reasons that involved fewest distortions. But using reserves requirements to control monetary expansion requires them to be linked closely to the monetary aggregates and high enough to have some effect. The Bank will continue to put the case against the imposition of reserve requirements. If the ECB does decide to use them, the Bank would argue that they should be low, broadly based and fully remunerated.

Conclusions

To design an operational framework for a monetary union between sovereign states with well-established national currencies and well-developed national financial markets is a unique challenge. The EMI has produced a considered and workable set of proposals. They emphasise open market operations and do much to encourage the development of integrated and efficient euro money markets; they give the ECB the operational flexibility it may need in Stage 3; and they balance the need for unified decision-making and harmonised procedures with the desire for operational decentralisation. The proposals demonstrate the willingness of the national central banks involved to think beyond their existing practices and backgrounds, to consider the needs of a new situation, and to reach a consensus in favour of a framework that should enable the ESCB to achieve its operational objectives effectively in Stage 3.

The gilt-edged market: developments in 1996

The gilt-edged market development programme continued in 1996, and gilt repo trading concluded a successful first year. Ten-year gilt yields were little changed at year-end from the previous year, but the yield curve was flatter. EMU-related market movements meant that gilts underperformed bond markets in European countries, despite the strength of sterling toward the end of the year. Gilt sales raised nearly £40 billion in 1996, taking the value of gilt-edged stock outstanding to £285 billion. Further reforms to the issuance process contributed to strong auction results and rapid sales of tap stocks in 1996. Secondary market turnover in gilts continued to increase. The year concluded with the Bank's proposals to extend its daily money-market operations to operate in gilt repo and to abolish the requirement that the gilt-edged market-makers be separately capitalised entities.

The reform programme

The process of reform in the gilt market continued in 1996. During the year, a number of developments which had been under discussion, or were awaiting implementation, came into effect, and further reforms were announced.

- The gilt repo market started on 2 January 1996. The previous limitations on repoing, borrowing or lending gilt-edged stock were removed. A wide range of institutions are now active in the gilt repo and stock lending market.
- Tax changes, effective from January 1996, facilitated the introduction of gilt repo and contributed to gilt market efficiency. All 'manufactured' dividends arising from repo or stock lending activities are now paid gross, and withholding tax has been abolished on dividends for wholesale investors holding their gilts in 'STAR' accounts in the Central Gilts Office (CGO).
- As a result of these tax reforms, nearly 80% of gilt holdings (by value) now receive coupon payments gross of withholding tax.
- In addition, a new taxation framework for gilts (and other bonds) was introduced in April 1996. Most wholesale investors are now taxed on a 'total return' basis, ie on both capital gains and income (and with tax relief for capital losses), removing tax distortions from trading, and promoting greater market efficiency. This was an essential precondition for the future introduction of gilt stripping (see below).
- In October 1996 a 'basis trading' facility on LIFFE in long gilt futures contracts was launched, allowing market participants to undertake transactions in the cash gilt and futures markets simultaneously at an agreed spread, removing execution risk.

Gilt auctions

- A number of incremental reforms were made to the gilt auction process, designed to decrease the risk associated with auctions for both the government as issuer and for the market.
- The average size of individual auctions was reduced by scheduling auctions monthly (except around the Budget) and by introducing periodic 'double-headed' auctions. 'Double-headers' allow the issue of two stocks of different maturities in the same month, moderating the supply in any one maturity at one time and potentially appealing to a wider range of end-investors.
- The amount of stock that gilt-edged market-makers (GEMMs) are allowed to bid for in auctions on a non-competitive basis (ie at the average allotted competitive price) was increased from a flat amount of £500,000, to 0.5% of the stock on offer. GEMMs can therefore cover more of a short position with certainty. There was no change to the expectation that GEMMs should bid competitively at auctions.
- The number of telephone bids that GEMMs are allowed to submit in the final minutes before close of bidding in an auction was increased, allowing GEMMs more readily to accommodate auction bids submitted by investors.

Other operational procedures

- The transparency of secondary market sales from official portfolios was significantly enhanced by the introduction of a 'Shop Window'—information on the Bank's screen pages—giving details of the amounts of stocks available for resale or switching. The Bank retains discretion on whether to accept bids.
- More generally, the Bank's publication of a revised *Operational Notice* in June 1996, describing its relationship with gilt market counterparties, further contributed to the transparency of the Bank's procedures.

Strips

- In May 1995, the Bank issued a consultative paper on the possible future introduction of a gilt strips facility. Such a facility would allow a standard coupon bond to be separated into its individual coupon and principal payments, so that they could be separately held or traded as zero-coupon instruments.
- The Bank published a further paper in May 1996 which set out decisions taken on the arrangements for the planned strips facility. The few remaining decisions will be announced as soon as possible.
- The 1996/97 *Debt Management Report* stated the authorities' intention that future medium and long maturity issuance should be strippable and that the strippability of future short-dated benchmark issues would be kept under review. In fact, all new benchmarks issued since that announcement have been strippable, including the new five-year benchmark, 7% Treasury Stock 2002, first issued in December 1996.
- As part of the policy of building up the stock of strippable gilts, 76% of stocks auctioned in 1996 were strippable. In addition, two conversion offers, from double-dated stocks, contributed to the increase in strippable stock to £57 billion outstanding by end-December.
- It was announced in 1995 that coupon interest on all strippable stocks would be paid gross of tax. To remove uncertainty about when this would take effect, it was announced in August 1996 that it would commence with the coupon payments on 7 June 1997, regardless of when the gilt strips facility becomes operational.
- In December 1996 the Bank issued a draft 'strips memorandum', designed to serve as a generic prospectus for gilt strips (avoiding the need for a separate prospectus for each strip).
- Towards the end of 1996, the Bank held a round of meetings with individual GEMMs to discuss their plans for the strips market.
- During 1997, the Bank will publish an update of the May 1996 paper, setting out all the decisions relating to the strips facility. The extension to the CGO upgrade timetable (see below) means that the strips facility will also be introduced slightly later than originally planned; it is expected that it will commence shortly after the CGO upgrade.

Central Gilts Office (CGO)

- Euroclear, Cedel and Bank of New York became CGO members and began offering settlement services, including tri-party repo services, in gilts on 4 March 1996.

- During 1996, the Bank published newsletters and consultative papers on the detail of work to upgrade the CGO, and convened meetings with market representatives to help take the project forward.
- On 3 December the Bank announced that it was extending the timetable for the upgrade of the CGO system (see the box) and that the target for inauguration was 26 August 1997. This extension was agreed partly in order to allow members to concentrate resources on the phased introduction of CREST; and also to allow sufficient time for a stable upgraded CGO system to be

Upgrade to the CGO system

The Bank announced on 24 November 1995 that the CGO system was to be upgraded to facilitate easier handling of gilt repo and strips. The target date for the inauguration of the upgraded system is 26 August 1997, following the August bank holiday weekend. The design of the system has been broadly finalised, following close consultation with practitioners from all parts of the gilt market via the 'CGO Upgrade Group' established by the Bank for this purpose.

Among the key benefits from the upgrading of the CGO will be new features which will:

- Facilitate stripping and reconstitution of gilts.
- Allow back offices to process repos more efficiently, helping them to settle a greater volume of trades as the market develops.
- Effect automatic reporting to the Securities and Futures Authority and the Stock Exchange, reducing back-office work for all gilt deals settling through CGO.
- Offer more flexible membership and account management arrangements. It is hoped that this will result in wider membership and increase the scope for investors to hold gilts in dematerialised form, reducing the volume of paper in the settlement process.
- Allow better control by settlement banks of their exposure to the CGO members for which they act, reducing any residual risk in the settlement process.

The upgrade will utilise CREST software, and arrangements are in place for continuing mutual co-operation with CRESTCo in the further development of this software. The Bank and CRESTCo have also confirmed their intention to keep open the option of possible consolidation of the two systems in the future.

available for trialling so that members could be confident of a smooth transition to the new system.

Use of gilt repo in money-market operations

- Since the start of the market in January 1996 (see the box on page 72), gilt repo has become the main sterling market in secured money and has developed considerable scale and depth.
- In December 1996 the Bank published proposals to extend its daily open market operations to include operations in gilt repo.
- The impact of the proposals is likely to go beyond money-market operations to the sterling markets more generally, and is likely to promote the further development of gilt repo.

Capitalisation of the GEMMs

- The Bank proposed that, at the same time as broadening the range of counterparties with which it conducts daily open market operations, its requirements for separate capitalisation would cease, as would the associated specialist supervisory arrangements, for both money-market and gilt market counterparties. The obligations of GEMMs to make markets in gilts and to participate in auctions will remain unchanged.

Taxation

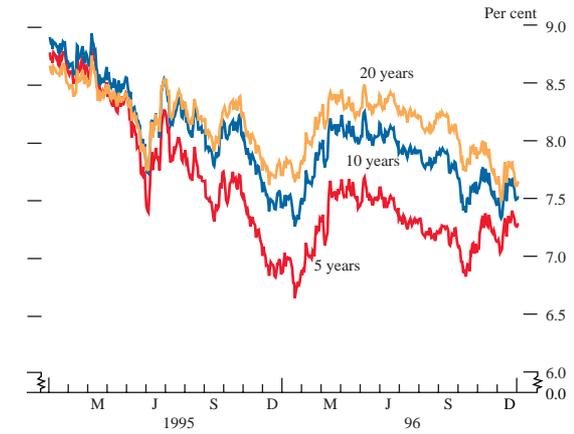
- In November, the Inland Revenue proposed that in 1997/98 additional categories of overseas investors should be able to receive gilt interest payments (on non-strippable gilts) without deduction of withholding tax. Like domestic corporates, foreign corporates can already obtain gross payment through STAR accounts, but the proposals would extend gross payment to overseas pension funds, foreign mutuals, and non UK resident individuals.
- The new regulations would substantially simplify both the tax treatment of gilts and the qualifying arrangements for receiving gross dividends, replacing three existing schemes which enable some overseas investors to obtain gross payment.

Gilt yields in 1996

At the end of 1996 the yield curve was flatter than a year earlier, with gilt yields little changed at medium maturities (see Chart 1). Although the UK market underperformed many European markets, whose bonds benefited from heightened expectations of their participation in Economic and Monetary Union (EMU), gilts outperformed US Treasuries.

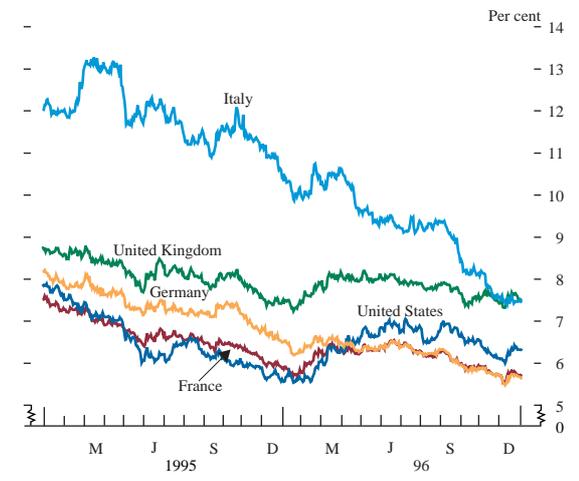
The low point of 1996 for the ten-year par yield (and for shorter maturities) was reached shortly after the start of the year, on 18 January. The UK market, which had risen with

Chart 1
Par yields on British government stocks at 5, 10 and 20 years



the sustained rally in European bonds since late October 1995, rose further with the cut in UK official rates on 18 January 1996. Thereafter, global yields rose as markets factored in the reduced prospects of further rate cuts in the major economies (see Chart 2). A series of comments by policy-makers in Germany, Japan and the United States contributed to the turnaround in sentiment, as did a number of data releases. Among the latter, the publication on 8 March of much stronger-than-expected growth in US

Chart 2
Ten-year benchmark yields

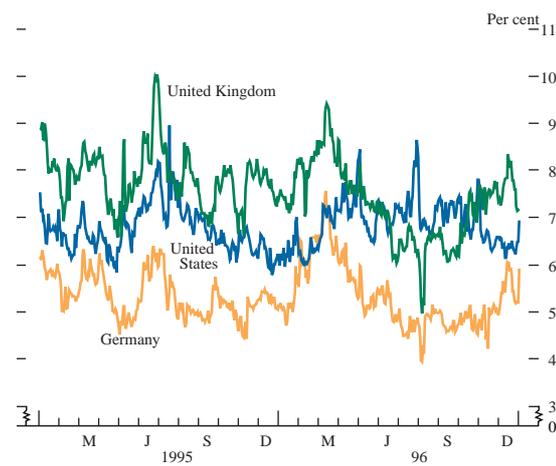


employment led to the year's sharpest one-day rise in gilt yields. Implied volatility⁽¹⁾ also rose sharply to over 9% (see Chart 3). Gilt yields across the maturity spectrum reached their highest point of the year in early May, with the rises again triggered by strong US activity data.

Official rates in the United Kingdom were cut in June and, between May and early October, yields in the United Kingdom trended downwards. Implied volatility fell below US volatility, reaching a low for the year in August. The particularly sharp decline in yields at the end of September and into October was largely US-led, as global markets

(1) Implied volatility is the expected standard deviation of annualised price movements in the futures contracts implied by options prices; higher implied volatility is generally associated with greater uncertainty about price movements in the underlying instrument (gilts in this case).

Chart 3
Implied bond market volatility



rallied following the Federal Open Market Committee's decision on 24 September to leave interest rates unchanged. Gilt market sentiment turned in mid-October with new domestic inflation and unemployment data. Yields rose across much of the curve following the rise in official interest rates at the end of October and the publication of the November *Inflation Report*, as the market reassessed UK inflation expectations. However, the market recovered in November and in early December, reflecting a continuing rally in European bonds, a strong sterling exchange rate, and an unexpectedly large public sector debt repayment in October. The UK Budget on 26 November had little impact on gilt yields.

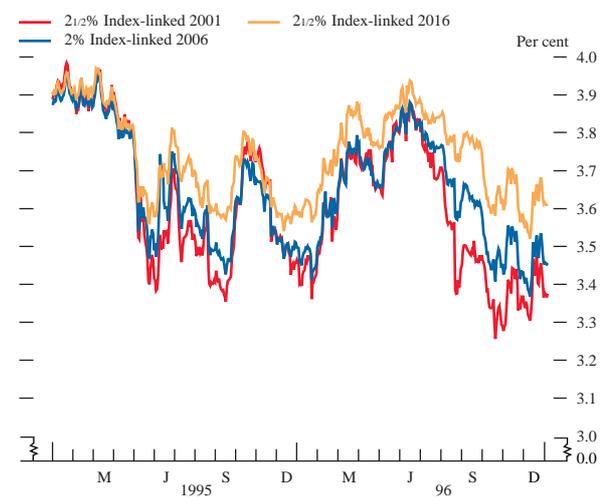
By the end of the year yields had again risen slightly, despite the continuing international interest in sterling, as government bond markets globally responded to an apparent warning by Federal Reserve Board Chairman Greenspan, that asset prices were overvalued. Ten-year gilt yields ended the year at around 7.50%, little changed from 7.45% a year earlier. UK and US ten-year yield differentials narrowed to around 120 basis points by year-end.

The reassessment of prospects for global interest rate cuts that took place early in 1996 was accompanied by a flattening of the gilt yield curve (see Chart 1). The spread between ten and five-year par yields narrowed from around 70 basis points in mid-February to less than 50 basis points in mid-April. The fall in yields in the following months was more pronounced at the short end and therefore resulted in a steeper yield curve, with the ten-year minus five-year spread approaching the 70 basis points level again by end-August. The yield curve began to flatten from early September in anticipation of higher future interest rates, after rates were left unchanged at the Monetary Meetings of 4 and 23 September and as the Minutes of the 30 July meeting, published on 18 September, revealed the Bank's preference for higher interest rates, and a willingness by the Chancellor

to raise rates pre-emptively if necessary. Yield spreads, particularly in the short-medium area, continued to narrow as the curve flattened, with an especially sharp movement following the 30 October increase in base rates (when yields at the shorter end rose, while those at the very long end fell). The spread between ten-year and five-year par yields ended the year at just over 20 basis points.

Unlike nominal conventional yields, real yields on UK index-linked stocks diverged during 1996, ending the year slightly lower at short and medium maturities, and little changed at longer maturities. As might be expected given that real yields should not be greatly influenced by inflation news, the volatility of real yields was much lower than that of conventional yields (note that the Chart 4 axis extends only from 3% to 4%). The real yields shown here are calculated by deriving the rate of inflation implicit in the indexed bond that would equate the return on an indexed gilt and a conventional bond of similar maturity.⁽¹⁾

Chart 4
Real yields on index-linked stocks



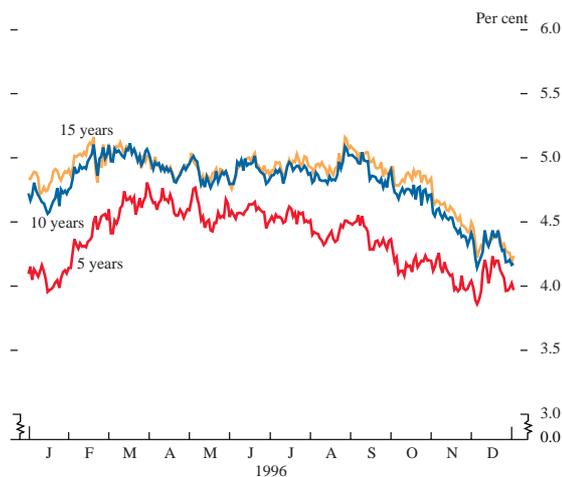
Inflation expectations⁽²⁾ (see Chart 5) at all maturities rose during the spring, with the steepest rise occurring at shorter maturities. Both real and nominal forward rates also rose. Inflation expectations tended to level out or decline after mid-April. However, while the decline in ten-year expectations largely continued for the rest of the year, inflation expectations at five years levelled out in October. At the end of the year, inflation expectations for ten and fifteen years ahead were somewhat lower than a year earlier and broadly unchanged for five years ahead. The convergence of inflation expectations was reflected in the flattening of the nominal yield curve.

Over the year, the spread of ten-year gilts over US Treasuries narrowed by over 60 basis points, but gilt prices underperformed against most European bonds (see Chart 2). In early 1996, gilts were particularly affected by political uncertainties and worries about the implications of bovine

(1) See *Working Paper No 23*, published in July 1994, 'Deriving estimates of inflation expectations from the prices of UK government bonds' by Mark Deacon and Andrew Derry.

(2) As derived from a comparison between the prices of conventional and indexed gilts. The comparison does not provide an exact measure, as it is not possible to separate out the influence of any inflation risk premium or of other factors influencing relative prices at specific times, such as the supply of particular gilts, from expectations of inflation.

Chart 5
Inflation expectations at 5, 10 and 15 years ahead^(a)



(a) Implied annualised inflation in the six-month period beginning 5, 10 and 15 years ahead.

spongiform encephalopathy (BSE) for government borrowing and the balance of payments. During the course of the year, however, the more important factor behind the underperformance of gilts was that previously 'high-yielding' EU bonds, such as those of Italy and Spain, benefited from changed market perceptions of the likelihood of EMU, and of those countries being among the first group of participants. Against French bonds, most of the underperformance occurred in the first quarter. French yields converged with those of Germany at this time and for the rest of the year, reflecting a belief in the markets that France and Germany were on course for EMU.

Interest rate cuts during the course of the year by the Bundesbank—which opened the way for monetary easing elsewhere in Europe—together with the presentation of budget packages in a number of countries aimed at ensuring compliance with the Maastricht deficit criterion, appear to have provided the main impetus for the narrowing of yield differentials. As can be seen from Chart 2, Italian ten-year bonds, which had yielded around 300 basis points over gilts at the start of the year, yielded slightly less than gilts by year-end.

Gilt sales requirement

The gilt sales requirement is set at the start of each financial year, April to March, in the remit given to the Bank by the Chancellor of the Exchequer. The sales requirements may be revised during the course of the year as the government's financing requirements change. Gilt sales in the first quarter of 1996—the final quarter of financial year 1995/96—totalled £10.4 billion and took gross gilt sales for the financial year to £30.7 billion. Partly as a result of a higher-than-forecast outturn for the PSBR, an underfund of £2.2 billion was carried into 1996/97.

The gilt sales target for 1996/97 was based on the forecast for the CGBR rather than, as previously, the PSBR. This change, which was announced in the *Report of the Debt*

Management Review published jointly by HM Treasury and the Bank of England in July 1995, means that money raised through debt issuance is now used entirely to finance central government operations, including any central government lending to other parts of the public sector (for example, local authorities). The CGBR for 1996/97 was initially forecast at £24.1 billion, but was revised in the Treasury's *Summer Economic Forecast* to £28.1 billion. The gilt sales target, which started the financial year at £32.6 billion before figures for the previous year were finalised, was increased to £39.9 billion by end-September, reflecting an underfund in 1995/96, the increased CGBR forecast, and the decision to call the 6³/₄% 1995–98 stock for redemption on 1 November (which added £1 billion to the total of maturing gilts to be refinanced). However, in the November Budget the forecast of the CGBR was revised down to £27.9 billion, while the assumption for the financing contribution from sales of National Savings products was raised from £3.0 billion to £4.5 billion. The gilt sales target was then revised to £38.4 billion for the financial year. By the end of December—three quarters of the way through the financial year—just over three quarters of this target had been met.

Stocks issued

Gross gilt sales during calendar 1996 were £39.5 billion, of which £29.1 billion was issued in the first nine months of the current financial year. Sales of index-linked gilts raised £6.6 billion. In both last year's remit to the Bank from the Government and the remit for 1996/97, the target for sales of indexed gilts was approximately 15% of total gilt sales; indexed sales amounted to 15.1% in 1995/96. The aim of approximately one third of conventional stock issuance in each maturity band (shorts: 3–7 years, mediums: 7–15 years, and longs: 15 years and over) was also achieved, with conventional funding distributed 35%, 33% and 32% across shorts, mediums and longs respectively. This target issuance pattern was repeated in the 1996/97 remit.

Ten of the auctions during the year sold existing stocks while three created new stocks. The first of the new stocks was a new 25-year issue, which became the longest maturity conventional gilt in issuance. The second was a new five-year floating-rate gilt to complement the existing 1999 floating-rate gilt, and in December a new five-year conventional benchmark stock was issued.

All the additional amounts of existing stocks created during the year were immediately fungible with the existing ('parent') outstanding amounts, providing investors with immediate liquidity. In the past, 'A' tranches of stocks, which did not become fungible with the parent stock until the next ex-dividend date, were sometimes issued when a stock was close to its ex-dividend date. However, the move to taxation of the total return on gilts (rather than just the coupon) and the payment of coupons gross of withholding tax for most investors, has largely removed the unattractiveness of purchasing stocks carrying a large amount of accrued interest. One stock was auctioned *within*

the ex-dividend period and so carried rebate rather than accrued interest; the first time this had occurred.

Of the £33 billion nominal of conventional stocks issued by auction during the calendar year, £25 billion was in stocks which will be strippable when an official gilt strips facility starts, probably in autumn 1997. The pool of strippable issues was further built up by two conversion offers during the year; 13½% Treasury Stock 2004–2008 into 8½% 2005 in September, and 12% Exchequer Stock 2013–2017 into 8% 2015 in December. Acceptances of the offers to convert these two double-dated stocks together added £2.8 billion to the outstanding amount of strippable issues.

Methods of stock issuance

Auctions

Issuance of stock by auction accounted for 98% of conventional sales in 1996, in line with the policy that auctions should constitute the primary means of conventional gilt sales. The frequency of auctions was increased slightly in 1996, with auctions (including dual auctions on two occasions) occurring in every month except November—the month of the Budget. An auction was held in August for the first time since 1992. Dual, ‘double-headed’ auctions (auctions of two separate stocks held in close succession) were held for the first time in July and October. Both the introduction of double-headed auctions and the holding of monthly auctions were aimed at reducing the size of individual auctions. The average size of all single auctions during the current financial year (1996/97) was £2.9 billion, compared with an average of £1.75 billion for each leg of the dual auctions.

Table A
Auction results

Stock title	Status	Amount of issue £ billions	Date of auction 1996	Average yield per cent	Times covered	Tail (yield in basis points)
8% 2000	Fungible Strippable	3.0	31 Jan.	6.74	1.96	2
8% 2021	New Strippable	3.0	28 Feb.	8.09	1.48	5
7% 2001	Fungible	3.0	27 Mar.	7.67	2.64	4
7½% 2006	Fungible Strippable	3.0	24 Apr.	8.08	2.65	2
8% 2021	Fungible Strippable	3.0	29 May	8.33	2.04	2
Floating Rate 2001	New	3.0	26 June	(a)	4.51	1
8% 2000	Fungible Strippable	2.0	23 July	7.20	4.81	0
8% 2015	Fungible Strippable	1.5	25 July	8.21	1.88	2
7½% 2006	Fungible Strippable	2.5	28 Aug.	7.90	2.69	1
8% 2021	Fungible Strippable	3.0	25 Sept.	8.14	1.73	2
7% 2001	Fungible	2.0	22 Oct.	7.10	3.57	0
8% 2015	Fungible Strippable	1.5	24 Oct.	7.86	2.66	0
7% 2002	New Strippable	2.5	4 Dec.	7.13	1.70	2

(a) Yield equivalent to 6 basis points below Libid.

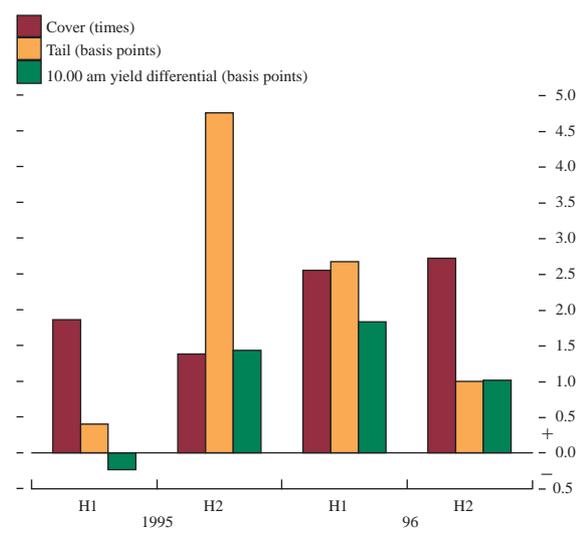
Table B gives figures on cover (the ratio of bids to stock on offer), tails (the difference between the average and the highest accepted yields), and the difference between the average accepted yield at auction and the yield calculated from secondary market screen prices at the close of bidding on auction day (the 10.00 am yield differential). Auction cover was on average higher in 1996 than in 1995, while yield tails were lower. However, the average 10.00 am yield differential was larger in 1996 than in 1995.

Table B
Auction outcomes

	1995	1996
Average		
Cover	1.65	2.64
Tail (basis points)	2.33	1.77
10.00 am yield differential (basis points)	0.50	1.39

Individual auctions produced varying outcomes throughout 1995 and 1996. In 1995 there was a marked contrast between the first and second halves, with lower cover, substantially higher tails, and a significant, positive 10.00 am yield differential (see Chart 6) in the second half of the year. In 1996, some of that reversed, with much

Chart 6
Auction results in 1995 and 1996



higher cover and smaller tails, particularly in the second half of 1996. However, although the 10.00 am yield differential tended to be narrower in the second half of the year, it remained positive. The ‘cheapness’ of the auction stock needs to be seen in the context of any underperformance of the stock in the longer run-up to the auction; the discount of the average price to the 10.00 am market price is only part of the picture.

The higher cover in auctions during 1996 reflected increased bidding by GEMMs on their own account, increased bidding by GEMMs on behalf of customers (making use of their increased bidding facility), use by GEMMs of the higher non-competitive bidding facility from April 1996, and the higher cover generated by the smaller, dual auctions. These changes in behaviour had thus been facilitated by the changes made by the authorities to the issuance process. As

can be seen from Table C, in percentage terms the increase in bids from customers was even more significant than that from GEMMs. These customer bids may be a substitute for buying the auction stock in the week before the auction on a 'when-issued' basis; Table C also shows that collective shorting of the auction stock (or its parent) by GEMMs to customers prior to the auction declined.

Table C
Auction participation^(a)

Average (b)	1995	1996
GEMMs' own account competitive bids	147	175
Customer competitive bids	17	82
GEMMs' cumulative shorting of positions during the when-issued week, up to the evening before the auction	32	18

(a) Average for all auctions (as a percentage of stock on offer).

(b) The figures are not weighted by the size of auction.

Bidding behaviour may have changed following the uncovered auction in September 1995, when the pre-auction activity failed to provide adequate price discovery for the auction amount to be sold in full, and also following the December 1995 auction, when the long tail showed that auctions could present opportunities to obtain stock relatively cheaply. Results since then suggest that although bids at or around the prevailing market price have certainly not diminished (as indicated by the shorter tail statistics in 1996), more low bids are now being submitted (as seen in the higher cover figures). These low bids may reflect increased uncertainty over the behaviour of other participants in the auction process: participants bid at what they believe is an appropriate price for the stock, but, in addition, they submit other, low bids that would enable them to acquire more of the stock relatively cheaply if other market-price bids have not been submitted in any volume.

The increase in cover has coincided with the first year of gilt repo trading. The introduction of repo may have attracted more participants to the market in general, and the ability to cover short positions via repo would have facilitated shorting the auction stock (selling the stock to an investor before having secured the stock at auction). The ability to repo out stock in order to finance holdings after the auction may have encouraged some increased activity in auctions, as well as in the secondary market. There was some repo tightness in auction stocks in the days leading up to an auction, although this tended to be pronounced only in the case of short stocks (mirroring the more general pattern in day-to-day repo trading). There were instances both of a relatively high volume of bids after little or no repo tightness (the October long auction) and of disappointing cover after pronounced repo tightness (the December short auction); it is too early to draw any conclusions about connections between repo activity and patterns of auction demand.

Index-linked gilts

Index-linked gilts continued to be issued through the tap mechanism. At the end of 1995 the authorities consulted the

market on the merits and practicalities of holding a pilot series of index-linked auctions in 1996/97, but concluded in favour of continuing with tap issuance for the time being. This reflected, in particular, market concerns about the lack of an adequate hedging tool.

An average of £550 million a month of cash sales of index-linked gilts was made during 1996. Sales were bolstered by a number of factors, including the decline and temporary reversal of the 'yield gap' with equities (the excess of dividend yields over real index-linked yields, using a flat inflation assumption) in the first half of the year, and specific investor demand. Among investors, there was anecdotal and some statistical evidence that pension funds were increasing the proportion of indexed gilts in their portfolios; of their £4.5 billion net purchases of gilts in the first nine months of 1996, £3.9 billion, or 85%, were in index-linked, compared with their end-1995 portfolio weighting for indexed gilts of 45%. The announcement that an auction experiment would not be tried in 1996/97, while the target percentage for indexed issuance would be held at 15% of total sales, also helped buoy the price of index-linked gilts.

The announcement in May that the US Treasury was considering issuance of indexed bonds (a description of the planned bonds was published in September) was generally considered to be a helpful development for the UK indexed market, although there was no immediate impact on yields. Details of US issuance were firmed up by the end of 1996, and the first auction was held on 29 January 1997.

Tap packages of indexed gilts issued during 1996 were exhausted (sold out) twice as quickly in 1996 as in 1995, after about five days, down from about ten days, reflecting stronger demand in the sector. This performance may have been helped by the change in the Bank's tapping procedures, with the initial tender held only half an hour after the announcement of the tap (rather than the next day, as in the first half of 1995). The size of indexed tap packages was increased during the first half of the year and the issue on 27 September of a total of £450 million nominal, equating to £725 million at market prices, was the largest package created on a single day since the end of 1993. One of the two stocks issued was exhausted on the same day and the other within two days, indicating substantial capacity on the part of investors to absorb, on occasion, indexed stock in large amounts.

Conventional tap issues

Taps of conventional gilts are undertaken for market management purposes. There were four such taps during 1996, for amounts between £50 million and £250 million (the amounts varying according to market circumstances). The precise circumstances for each of the taps differed, but on two occasions a main indicator of the need for market management was extreme tightness in the repo market. All four taps were exhausted on their day of issue, reflecting the excess demand in the market. The procedure for the issue

Working Group on the gilt market after EMU

This Group was established in September 1996 and comprised experts on gilts and EMU issues, including representatives from investors, the Gilt-Edged Market Makers Association (GEMMA), other relevant industry associations, the Stock Exchange, LIFFE, the Bank of England and HM Treasury.

The Group's objectives were:

- (a) to identify the practical issues that will arise for the gilt market following the introduction of the euro, whether or not the United Kingdom enters the single currency area;
- (b) to devise and discuss solutions, addressing the issues raised and taking into account measures planned in other European bond markets;
- (c) to make recommendations to the competent official and market bodies; and
- (d) to bring its conclusions to the notice of practitioners in the gilt market and other sterling markets, participants in other discussions of the implications of the euro for securities and money markets, those involved in other European bond markets, and to the general public.

The Group restricted its attention to the gilt market and did *not* cover, for example, the United Kingdom's foreign currency debt or reserves, or other private sector sterling debt and equity markets. It discussed the harmonisation of government bond market conventions, the redenomination of gilts if the United Kingdom joins EMU, provisions for private investors during the transition phase, when sterling would still be used as a denomination of the euro, government bond derivatives in EMU and the co-ordination of issuance by different public debt issuers in EMU.

The Group published its report on 16 December 1996 as part of the third issue of the Bank's regular 'Practical Issues Arising from the Introduction of the Euro' publication. Its main recommendations were:

If the United Kingdom joins EMU:

- complete and simultaneous redenomination of existing gilts from sterling into euro by law; this should take place early in 1999 if the United Kingdom joins EMU at the outset or as soon as possible after it joins if it participates at a later date;
- any further changes to the terms of gilts should be made separately by a series of conversion offers, which could take place before and after redenomination;
- gilt prices should be quoted in decimals rather than fractions ($1/32$ nds are used currently);

- gilts should trade in nominal amounts that are multiples of one cent (this would be consistent with the current position in which gilts can trade in nominal amounts of one penny);
- private investors should not be disadvantaged by the redenomination of gilts; in particular:
 - HM Treasury and the Bank of England should consult further with representatives of the banking system, in order to ensure that personal investors will be able to receive value in sterling units on euro-denominated gilts during the transition period, when most are likely to have sterling-denominated bank accounts; and
 - the Bank of England should account to holders of gilts in both sterling and euro units until the end of the transition period;
- the Bank of England should consult with CGO users on whether all payments should be input to CGO in euro, or to what extent inputs in sterling units would be allowed during the transition period; and
- HM Treasury and the Bank of England should consider with other prospective government issuers of euro-denominated debt how information can be exchanged to minimise the risk of large coincident official debt issues.

Whether the United Kingdom joins EMU or not:

- gilts should continue to have semi-annual coupons;
- the gilt market should retain the daycount convention of actual/365 unless there is a wider initiative for harmonisation in Europe or preferably globally, in which case it should argue for actual/365 or actual/actual;⁽¹⁾ and
- new and existing issues of index-linked gilts should remain linked to the UK retail price index.

If the United Kingdom does not join EMU:

- the Bank of England should consult gilt market participants on the desirability of quoting gilt prices in decimals rather than fractions.

These recommendations were those of the Group and not necessarily the views of the Bank of England, HM Treasury or any of the other bodies represented. The decisions whether and how to carry the recommendations forward now lie with the relevant official and market authorities.

The Bank has now broadened the work of the Group to embrace other financial markets in London. Its remit and composition have been adapted accordingly.

(1) Daycount conventions are used to calculate redemption yields and accrued interest on bonds. For example, the accrued interest payable on a gilt using the 'actual/365' convention would be the coupon, multiplied by the actual number of days since the last dividend date, and divided by 182.5 (half of 365 because dividends on gilts are paid semi-annually). The calculation using the 'actual/actual' convention is the same, except that the denominator used is the actual number of days in the dividend period. Most European government bond markets use a third, less exact convention, which assumes a 360 day year of twelve 30 day months ('30/360') to simplify the calculation.

of 7³/₄% 2006 in November differed slightly from the usual tap procedures, in that the small amount of stock created was placed in the Shop Window (see below) for sale by tender with no minimum price. The issue was sold at a three tick (³/₃₂nds) premium to the secondary market price.

Secondary market sales

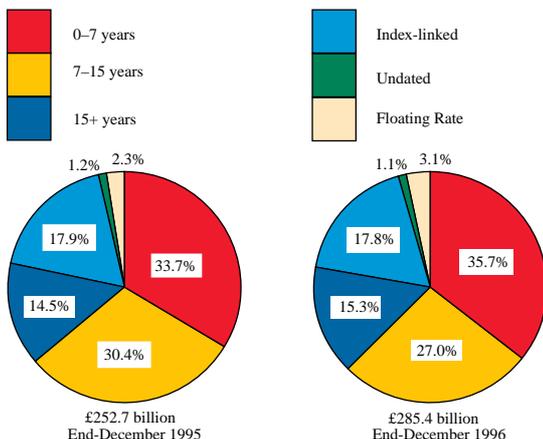
Net secondary market sales constituted just 0.5% of total gilt sales in 1996, consistent with the authorities’ policy of concentrating sales in conventional auctions and index-linked tap issues.

The Shop Window, which began operation in July, introduced greater transparency to sales into the secondary market of stocks held in official portfolios. Stocks available for sale (except index-linked gilts) are posted on the Bank’s screen pages. Stocks in official portfolios that are not available for sale, for example because they are of similar maturity to stocks recently auctioned, are shown on a separate screen, and are available only for switching. Those conventional stock holdings which are not intended for resale (ie ‘rump’ stocks of less than £100 million outstanding and bonds near to redemption) are not included in the Window. The Bank’s *Operational Notice*, issued in June 1996, set out general guidelines on the operation of the Shop Window, and specified that large holdings of stocks would be available for sale through mini-tenders.

Stock outstanding

Chart 7 shows the breakdown of stock outstanding (in nominal terms, but including the inflation uplift on indexed gilts) as at end-1995 and end-1996. The total amount of gilts outstanding rose from £252.7 billion to £285.4 billion. Most of the rise was in short-dated conventional gilts, reflecting both new issuance (two auctions of medium stocks being scheduled for the fourth quarter of 1996/97) and the aging of the existing portfolio. The proportion of shorts:mediums:longs within conventionals changed from 43:39:18 to 46:35:19. The percentage of indexed gilts in the portfolio was little changed; new issuance was partly offset by the redemption of the 2% 1996 indexed gilt.

Chart 7
Maturity breakdown of stock outstanding^(a)



(a) Assuming latest possible redemption date for double-dated stock.

Table D shows the 20 stocks of which there was £5 billion nominal or more outstanding at the end of 1996, and compares with 18 such stocks at end-1995. Large issue stocks tend to trade with greater liquidity in the secondary market. The total nominal outstandings of the 20 largest stocks was £158 billion at end-1996, or 68% of total conventional stock.

Table D
Large-issue stocks at 31 December 1996

Stock	Original issue date	Amount outstanding (£ millions)
8% Treasury Stock 2015 (a)	January 1995	13,787
7% Treasury Stock 2001	July 1993	12,750
7 ¹ / ₂ % Treasury Stock 2006 (a)	September 1995	11,700
8 ¹ / ₂ % Treasury Stock 2005 (a)	September 1994	10,373
8% Treasury Stock 2000 (a)	October 1994	9,800
8% Treasury Stock 2021 (a)	February 1996	9,000
8% Treasury Stock 2003	December 1992	8,600
7 ¹ / ₄ % Treasury Stock 1998	December 1992	8,150
8 ³ / ₄ % Treasury Stock 2017	April 1992	7,550
8 ¹ / ₂ % Treasury Loan 2007	July 1986	7,397
6% Treasury Stock 1999	October 1993	6,950
9 ³ / ₄ % Treasury Stock 2002	August 1995	6,527
6 ³ / ₄ % Treasury Stock 2004	September 1993	6,500
8% Treasury Stock 2013	April 1993	6,100
Floating Rate Treasury Stock 1999	March 1994	5,700
9% Treasury Loan 2008	February 1987	5,621
8 ³ / ₄ % Treasury Loan 1997	October 1969	5,550
9% Treasury Stock 2012	February 1992	5,361
9% Conversion Stock 2000	March 1980	5,358
9% Conversion Loan 2011	July 1987	5,273

(a) Strippable stocks. The coupons on these stocks will be paid gross of withholding tax from June 1997.

Two of the largest stocks—8¹/₂% 2005 and 8% 2015—were built up further in size during the year through the two conversion offers mentioned earlier. These were the first such offers since 1991, and were undertaken so as to build up the pool of strippable stocks ahead of the strips market. They involved an invitation to exchange one stock—a relatively small, ‘off the run’, double-dated issue—for the more liquid strippable issue, in a ratio set by the Bank, taking account of relative market prices. In both cases, more than 90% (by value) of the holders of the stocks accepted the offer, and £2.8 billion was added to the pool of strippable stocks. At end-December the total value of strippable stocks was £57 billion, 25% of total conventional stocks.

In recent years, the Bank has asked CGO members to provide a sectoral breakdown on the beneficial ownership of the gilts in their accounts at the end of the year. The introduction of gilt repo trading necessitated a review of how the survey would be conducted in future. In discussions with a number of CGO members, it was found that many would be unable to tell whether their nominees’ account holdings were inflated by stocks reversed in through repo, or deflated by stock repoed out, since they execute trades at their customers’ instruction, without necessarily being told the nature of the transaction. They would therefore be unable to identify beneficial holdings accurately. The Bank therefore decided to suspend the survey for twelve months, rather than ask CGO members to

The gilt repo market

The market in sale and repurchase agreements in gilts began in January 1996, when all official impediments to gilt repo were removed; anybody is free to borrow or lend gilts for any purpose and with any counterparty, subject to any relevant regulatory or legal requirements. During its first year, gilt repo developed into the major sterling market in secured money, dwarfing volumes in some more traditional instruments. The gilt repo market developed in an orderly way, and generally high standards of conduct have been maintained. A number of features characterise the gilt repo market.

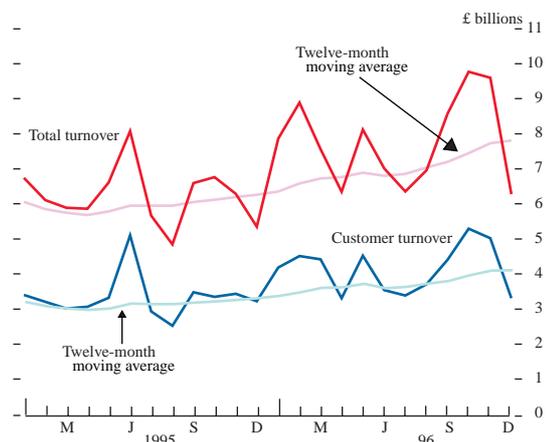
- Use of the standardised documentation, comprising the PSA/ISMA Global Master Repurchase Agreement with an annex specifically covering gilts, is almost universal, underpinning the safety of the market.
- Observance of the Gilt Repo Code of Best Practice, its principles and conventions, has been widespread, helping to establish good practice as the norm in the market.
- In accordance with the Code, many participants routinely call for margin when market price movements leave them with a material exposure, thus restoring the value of their own security and contributing to the security of the market as a whole.
- Along with the development of gilt repo, the stock borrowing and lending of gilts has also flourished, and many players successfully intermediate between different market participants to integrate these two closely related markets.
- Participation in the market is gradually extending from the core players of discount houses, other banks, and international investment banks, to the building societies, institutional investors, overseas funds, and some corporates.
- Settlement has normally been smooth, and failures to deliver have been relatively rare. Market participants can agree to accept partial deliveries of trades, rather than force a fail, and the Code of Best Practice recommends that participants sub-divide larger trades into smaller sizes, to minimise the incidence of fails.
- A substantial market has developed in general collateral (GC) gilt repo, used for borrowing and placing money against miscellaneous gilts as collateral, for example to finance portfolios of gilts. The market is already liquid at the short end of the maturity range, and liquidity is gradually extending outwards to maturities of several months.
- The volume of GC business tends to fluctuate with interest rate expectations, as repos can be used to take a position on the future level of short-term interest rates.
- An active market has also developed in 'specials', where a specific gilt is 'reversed in' (borrowed) in order to cover a short position. When the specific gilt required is hard to borrow, its repo rate (in effect, the cost of borrowing it) adjusts to reflect its scarcity, allowing the price mechanism to equate demand and supply in the market.
- Special rates increase the returns to an investor of lending their stock via repo, without (normally) making it uneconomic for the borrower to cover its short position in that stock.
- The Bank monitors repo rates and other market developments from its dealing room, and maintains regular contact with key repo market players.
- The Bank's proposals to conduct daily money-market operations in gilt repo are widely expected to accelerate the growth in and development of the gilt repo market.

provide potentially flawed information on beneficial holdings that could be misleading.

Turnover in the gilt market

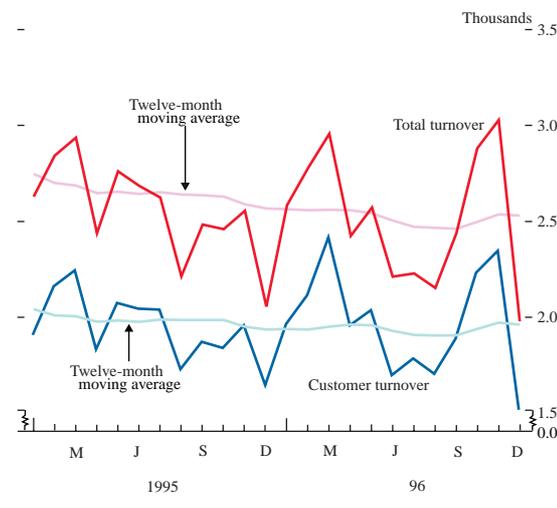
Turnover by value of gilts (excluding repos) on the London Stock Exchange was on a rising trend in 1996 (see Charts 8 and 9); average total daily turnover was £7.8 billion in 1996 compared with £6.3 billion in 1995, with the increase roughly equally divided between customer trades and market principal trades. The annual increase in turnover value, of nearly 26%, was double the increase in the value of gilts outstanding during the year. The peaks in activity occurred in February, October and November; periods when the market fell and volatility rose. The number of bargains was little changed in 1996 from 1995, continuing the trend towards a larger average

Chart 8
Average daily gilt turnover: by value



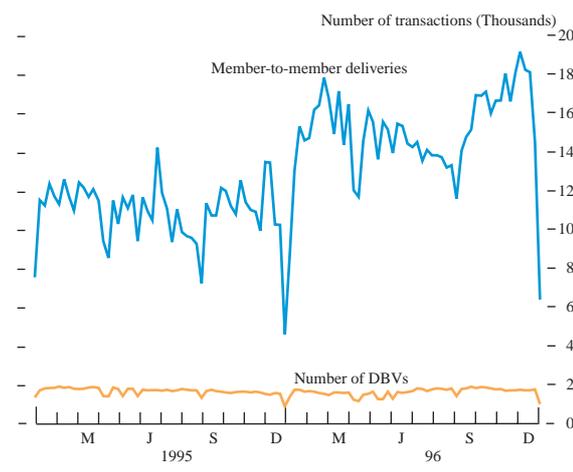
customer bargain size—£2.1 million compared with £1.7 million in 1995.

Chart 9
Average daily turnover: bargains



Data on work volumes (the number, not the value, of transactions) in the Central Gilts Office are shown in Chart 10. The number of member-to-member deliveries (transfers of specific stocks) increased sharply in 1996, to an average of around 15,000 per week compared with 11,000 in 1995. The number of weekly transactions in delivery-by-value trades (overnight transfers of unspecified gilts to a specified value, often used as general collateral in repo trades or as collateral against loans of specific stock) remained at roughly 1,700 per week, virtually unchanged from 1995. This probably reflects an increase in transaction

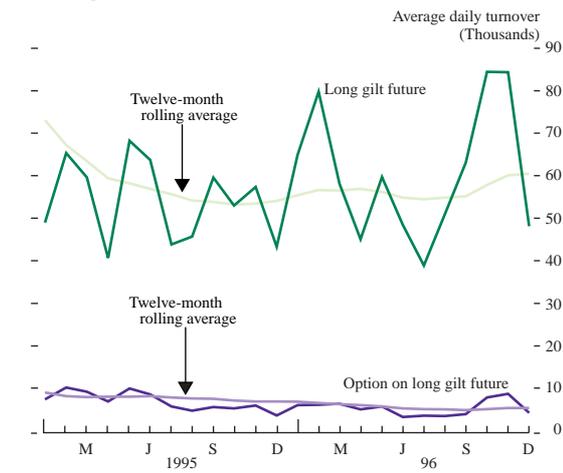
Chart 10
CGO weekly transaction numbers



sizes, as well as some disintermediation of transactions previously intermediated by Stock Exchange money brokers, now that some stock lending and repo is undertaken without an intermediary. An intermediated transaction involves two transfers—one to and one from the intermediary—so disintermediation halves the apparent volumes (while the underlying business remains the same).

Turnover in long gilt futures on the London International Financial Futures and Options Exchange (LIFFE) was higher in 1996, at an average of 60,000 contracts per day compared with 54,000 in 1995 (see Chart 11). In a similar pattern to cash market activity, volumes were highest in February, October and November, months when the market fell sharply. Options turnover continued to decline; at an average of 5,000 contracts per day, volumes were down 23% on 1995. It is possible that the introduction of generalised gilt repo trading in 1996 reduced the attractions of using options to create synthetic short positions.

Chart 11
LIFFE gilt derivatives: number of contracts



GEMMs’ financial performance

After returning to profit in 1995, the GEMMs made operating profits of approximately £11 million for the year as a whole. As in previous years, performance in 1996 varied markedly between individual GEMMs. The GEMMs were less successful in the first quarter of 1996, with only a third of market-makers returning a profit between January and March. More favourable market conditions in the rest of 1996 helped GEMMs to make a profit in every other quarter (with the highest profits occurring in the third quarter).

Figures for GEMMs’ profitability exclude income from gilt-related business booked outside the GEMM, which can be significant. Throughout 1996, there was an increase in the amount of related business (such as hedging and arbitrage trading) booked elsewhere in the groups of which the GEMMs are a part, partly reflecting the introduction of gilt repo. So Table E does not fully reflect the profitability of gilt market activity.

Two GEMMs left the market during 1996, leaving a total of 18 at the end of the year. Retained profits of £11 million were more than offset by net capital withdrawals of £246 million, resulting in an overall fall in the amount of capital dedicated to gilt market-making from £807 million at the end of 1995 to £572 million at the end of 1996. Much of the fall in capital can be attributed to the lower capital requirements of the Capital Adequacy Directive (CAD) regime for GEMMs, which replaced the ‘Blue Paper’ regime at the start of the year and which allows a greater

Table E
Capitalisation of gilt-edged market-makers

£ millions

	Oct. 86– end-1990	1991	1992	1993	1994	1995 (a)	1996 (a)
GEMMs' capital at beginning of period (b)	595	395	432	511	734	812	807
Net injections or withdrawals of capital	-38	-12	15	164	138	-30	-246
Operating profits (+)/ losses (-) (c)	-162	49	64	59	-60	25	11
GEMMs' capital at end of period	395	432	511	734	812	807	572

- (a) Data for 1995 are amended and data for 1996 are provisional.
 (b) Oct. 1996 to start-1996 capital base as set out in the Bank of England's 'Blue Paper' ('The future structure of the gilt-edged market') published by the Bank in 1985 and reprinted in the June 1985 *Quarterly Bulletin*, pages 250–87. End-1996 capital base as set out in the Bank of England's 'Blue Folder' ('Supervisory arrangements for core participants in the gilt-edged & money markets') published by the Bank in May 1996.
 (c) Net profits/losses after overheads and tax.

recognition of offsetting positions than did the previous regime.

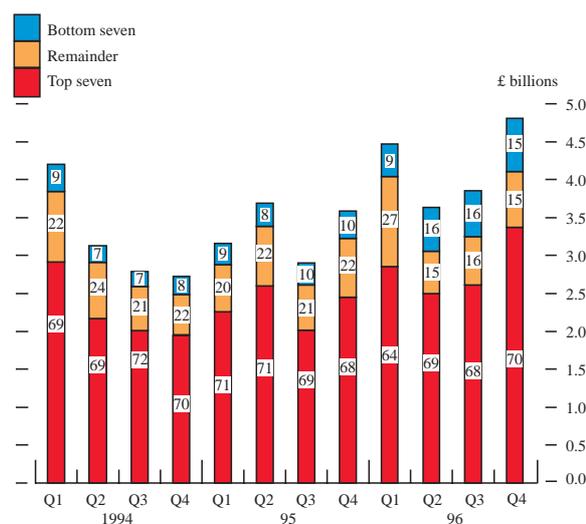
Approximately £32 billion of business in index-linked gilts was transacted by the GEMMs in 1996. Although the volume of business barely changed from the previous year, the number of players with more than 5% of index-linked business fell, from eight to seven. This was reflected in an increase in the combined market share of the most active five GEMMs in the index-linked business from 76% in 1995 to 79% in 1996.

Chart 12 shows GEMMs' retail trade with clients and agency brokers.⁽¹⁾ The total share of the most active seven firms fell from 70% in 1995 to 68% in 1996. Combined with the departure of two of the smaller GEMMs, this led to a more even distribution of overall business among the market-makers, in contrast to the position for indexed gilts alone. The composition of the most active seven firms remained unaltered for the second year running, and the same three GEMMs held the top three slots.

Separate capitalisation

The Bank proposed in its December consultative paper on money-market reform⁽²⁾ to remove the requirement for

Chart 12
Distribution of GEMMs' retail turnover^(a)



(a) Figures shown in the columns are the percentage market shares of each group of GEMMs.

GEMMs to be separately capitalised. This proposal reflects the changing structure of the sterling markets and the fact that the Bank's counterparties in the money markets will no longer need to be specialist entities. It will allow GEMMs to locate their gilt and other sterling business wherever it best fits into the group structure. Where they are part of a larger financial grouping, the Bank's counterparties in the gilt market will no longer need to be separately incorporated subsidiaries of that group.

The removal of separate capitalisation will enable GEMMs to assimilate their businesses into group-wide securities trading operations. The regulatory capital requirements for the combined entity should be less than that for the sum of each separate firm, due to hedging opportunities and the potential to offset positions between each part of the group. It will also be possible for GEMMs to integrate their systems, management, and controls structure more fully with those of the rest of the group.

(1) This measure of 'retail' does not include trade with inter-dealer brokers, direct trades with other GEMMs or trades with the Bank. In order to offer a better comparison between companies engaged in very similar business activities, the data exclude small-deal specialists, which conduct a large number of relatively low-value trades, mainly with personal investors.

(2) 'The Bank of England's operations in the sterling money markets', issued on 4 December 1996.

New arrangements for issuing banknotes

In March 1996, the Bank announced a major restructuring of its regional activity, which will result in the closure of four of its five regional branches. Simultaneously, the Bank announced an expansion of its industrial and economic liaison role in the regions: agencies will continue to operate from each city where branches are closing, as well as from three new locations. The Bank's branches have hitherto played an important role in issuing, sorting and receiving notes, and this article describes some consequential changes to these arrangements.

Background

As well as printing its banknotes, the Bank is responsible for issuing them through the banking system and for taking them back and destroying them when they are no longer fit for circulation. Currently some 1,370 million new notes are printed each year, and a similar number withdrawn from circulation when they are no longer fit for use. The cost of producing banknotes in the year to end-February 1996 was £37.7 million, and of issuing, storing and redeeming them, £20.7 million.⁽¹⁾

For many years, the Bank has issued and redeemed notes primarily through the larger cash-handling banks and the Post Office—which together make up the Cash Services Group of the Association for Payment Clearing Services (APACS). These banks are, in effect, wholesalers, who take notes from the Bank (and return them) in bulk and provide banknote services for their own customers and for other banks and financial institutions.

The Bank has also played a role in recycling used notes to meet both seasonal demand and imbalances between the banks. Primarily, this has involved storing used notes for subsequent reissue, but since 1984 the Bank has also supplied certain banks with notes that are fit to be reissued from ATM machines, through a commercial sorting contract. The Bank's role in sorting for ATM fitness is small—supplying perhaps 10% to 15% of the total demand for ATM-fit notes, with the banks themselves producing the remainder.

All these arrangements have worked well for a number of years. But they give rise to significant public expenditure costs and in 1995 the Bank initiated a wide-ranging review in order to achieve more efficient arrangements for the processing, storage, distribution and collection of banknotes. This review was undertaken against a background of considerable change in the cash-handling industry in recent years—notably the creation by the larger banks of regional cash centres, a sharp rise in demand for ATM-fit notes, and

an associated expansion in the banks' own capacity to sort notes for reissue. To a considerable degree, therefore, there is now duplication between the commercial banks and the Bank in this area.

The review was carried out with the full co-operation of APACS and the relevant banks, and the Bank is very grateful to all who have readily contributed to the debate and are now working constructively and co-operatively on implementing the new arrangements.

The new arrangements

The main conclusion of the review was that substantial savings in public expenditure could be achieved from eliminating the duplication of functions between the Bank and the commercial banks. In particular, the banks will in future take over the main responsibility for storing, sorting and reissuing notes that are fit to be recirculated. Further, the Bank will in future conduct its core note distribution functions—the issue of new notes and the authentication and destruction of soiled notes—from just two sites, one in the South of England, split between the Bank's Head Office in London and its Printing Works at Debden in Essex,⁽²⁾ and one in the North, at Leeds.

The annual saving to the public sector from ceasing note functions at four Branches⁽³⁾ is in the region of £4 million. There may also be some savings for the banks.

Implementation

The Bank is working with APACS and the note-handling banks to ensure that the new arrangements are introduced smoothly, with no diminution in the service provided to the public. The Bank has been particularly concerned to ensure that those banks which are typically 'short' of notes can obtain supplies readily from those that are typically 'long' (eg those that take in cash from large retailers). In order to achieve this, the banks—under the guidance of APACS—have set up co-operative arrangements, under which note surpluses and deficits are matched. This arrangement was

(1) More statistics on the numbers of notes printed, and on costs, can be found in the Bank's *Annual Report*, available from the Bank's Public Enquiries Group (telephone 0171-601 4878).

(2) The precise distribution of note-issuing functions between Head Office and Debden is still under review.

(3) The Bank's branches at Birmingham, Bristol, Manchester and Newcastle will have closed by 31 October 1997.

introduced initially in the region covered by the Bank's Birmingham Branch and has been widened since to include the Manchester area. During the next few months, it will be extended to the rest of the country.

The Bank will continue to monitor closely the quality of notes in circulation, and is working with the banks to ensure that their sorting machines accurately verify genuine banknotes.

The financing of technology-based small firms

By Adrian Piper and Melanie Lund of the Bank's Business Finance Division.

This article summarises the report published by the Bank of England on 28 October 1996, highlighting the main findings and outlining the Bank's recommendations.

Introduction

When the Government's third competitiveness white paper—'Competitiveness: Creating the Enterprise Centre of Europe'—was published in June 1996, it noted that the Bank of England, in co-operation with Government, would be investigating the extent to which small, technology-based firms face particular problems in raising finance, especially at the start-up and early development stages. The report,⁽¹⁾ summarised in this article, is the outcome of that investigation.

The Bank's report focuses on the financing of small technology-based firms at the seedcorn, start-up and early stages in the United Kingdom. The claim of underfunding is considered and the extent to which small, technology-based firms are at present adequately and appropriately financed is assessed. The Bank has endeavoured to examine all potential sources of finance, although we have paid particular attention to the role played by the British venture capital industry in the provision of equity capital. The way in which technology-based firms are financed in other industrialised countries has also been considered. The report makes tentative recommendations, with the intention of stimulating further debate.

In producing the report, the Bank consulted widely in both the public and private sectors, seeking particularly the views of the providers and users of finance, relevant Government departments, and others with a particular knowledge of the subject.

The Bank also attached considerable importance to obtaining at first hand the views of a range of technology-based firms about their experiences of seeking finance in the earlier stages of their life cycle. Between May and July 1996, representatives from the Bank's nine regional Agencies conducted a series of interviews with directors and senior managers at 59 technology-based firms at various stages of development. We were struck by both the complexity and the variety of financing experiences evidenced by these firms.

The following is a summary of the report.

The report

Chapter 1 outlines the background to the report, explains its methodology and adopts a reasonably broad definition of a technology-based small firm.

Chapter 2 considers the life cycle of technology-based firms and the extent to which their financing needs differ from the generality of small firms, particularly in the earlier stages of their development.

Chapter 3 discusses a wide range of potential suppliers of finance to technology-based small firms, including: banks, venture capital firms, seed-capital firms, business angels, corporate venturing, technology transfer approaches, business incubators and innovation centres, and capital markets. Particular attention is paid to the role of the venture and seed-capital industries.

Chapter 4 outlines the findings of the programme of interviews with technology-based firms carried out by the regional Agents, emphasising the diversity of approaches to the financing of this sector.

Chapter 5, which is primarily the work of the Cabinet Office, examines the financing of technology-based small firms in other industrialised countries: the United States, Canada, Germany, France and Japan.

Chapter 6 looks at the role of public policy in addressing the financing needs of technology-based small firms.

Chapter 7 sets out the Bank's recommendations.

Observations and findings

For a number of years, reports and studies have emphasised that technology-based small firms are of considerable potential significance to the economy of the United Kingdom.

As in the United Kingdom, governments in other G7 countries are according increasingly high priority to meeting the financing and other needs of early-stage technology-based firms.

(1) A copy of the full report can be obtained by writing to the Business Finance Division, Bank of England, Threadneedle Street, London, EC2R 8AH, or by telephoning Public Enquiries on 0171-601 4878. Questions relating to the content of the report should be addressed to the authors, Adrian Piper (0171-601 4117) and Melanie Lund (0171-601 4430).

There is still, however, scope to raise the profile of this sector in the United Kingdom and to learn from other countries, particularly the United States.

Appropriate finance is a major requirement for technology-based small firms, but improving the management, marketing and financial skills of the entrepreneurs is very important too.

The distinctive requirement of technology-based firms at the seed, start-up and early stages is for genuine risk capital. Amounts required may be relatively small, but investment horizons may be long. A 'hands-on' approach by the finance provider is often needed.

Classic venture capital should provide part of the answer, but the industry in the United Kingdom has tended in recent years to focus less on early-stage investments (especially in technology) and more on development capital, management buy-outs (MBOs) and management buy-ins (MBIs).

The seed-capital sector of the industry is efficient and professional, but it is small in scale and institutional investors are wary of putting money into seed and early-stage funds.

Perceived high risks, understanding the technology, and relatively low average rates of return have increased institutional reluctance to invest in early-stage technology firms.

The foregoing may point to some weakness or inefficiency in the market, which can be addressed in part by encouraging more investment by business angels, in partnership with seed capitalists. Corporate venturing also offers considerable scope.

Banks have an important role in providing working capital and (where appropriate) longer-term loans, as well as banking services.

Changing attitudes towards technological entrepreneurship has significant implications for the educational system at all stages.

Improving the financing of technology-based firms requires a partnership between public and private sectors, based on a fair distribution of both risks and rewards. There is no quick and easy solution.

Recommendations

The Bank's recommendations fall into four categories:

Raising the profile

- Maximise the use of Business Links and other support agencies.
- Use serial entrepreneurs as role models.
- Strengthen the teaching of technology in schools.
- Encourage entrepreneurship in universities.
- Promote sectoral campaigns.
- Develop corporate venturing.

Improving understanding

- Research the role of technology angels and informal venture capital.
- Understand better the potential contribution of corporate venturing.
- Develop business incubation.

Increasing the supply of finance

- Improve management skills, to encourage finance providers.
- Develop venture and seed-capital finance.
- Increase the role of the banks.
- Continue and develop Small Firms Merit Award for Research and Technology (SMART), and Support for Products Under Research (SPUR) schemes.
- Make more use of the Small Firms Loan Guarantee Scheme.
- Investigate the role of Small Business Investment Companies in the United States.
- Review Venture Capital Trusts and the Enterprise Investment Scheme on a regular basis.

Technology-based firms

- Consider the full range of possible sources of finance.
- Improve management and financial skills.

These recommendations were put forward primarily as subjects for further debate. We propose to co-host a conference, with the Royal Society and the Confederation of British Industry, on 3 March 1997, at which representatives from the scientific, financial and business communities can discuss the way forward. In the next edition of the *Quarterly Bulletin*, a further article will discuss reactions to the Bank's findings and recommendations.

Britain's regional economies: how different are they, and how should those differences affect monetary policy?

In this lecture, the Deputy Governor considers⁽¹⁾ the degree to which the United Kingdom's regional economies differ, in economic terms, both absolutely and by European standards; and also recent trends in their relative positions. He goes on to ask why regional trends should matter to monetary policy makers. He argues that an examination of the differences between regions can improve their understanding of the nature of the economic cycle, and of the likely effect of shocks on the national economy. Moreover, regional patterns of economic activity may be affected by monetary policy—and, in particular, the authorities need to take account of such patterns when assessing what degree of monetary tightness is appropriate in the pursuit of national price stability.

On the way here this evening, I crossed the North/South divide. I do not recall doing so, and nobody checked my passport. But there is no doubt that the crossing took place. At lunch-time I was luxuriating in the prosperous South East, at the apex of the golden triangle, Paris-Frankfurt-London, within which Europe's most prosperous populations flourish. Where people confuse their salary and their telephone number, drink tea at four fifteen and eat their dinner in the evenings. And of course they talk proper.

Now I am in a godless land, where men communicate in a strange guttural tongue, houses can be bought for the price of a decent City lunch and it is already six hours past dinner-time. The natives, in the North, may have a wonderful sense of rhythm. But the driving beat of the global economy is only dimly heard.

One or two of you may have thought you detected a faint note of irony in those observations. A rare commodity in the plain-speaking North. And, as a born and bred Mancunian myself, I hope my intentions are not misunderstood. I find the easy regional caricatures we lazily adopt in this country tiresome and unimaginative. They also tend to obscure economic realities, rather than illuminate them. So I propose to abandon these clichés for the evening, and I hope that any dour, curmudgeonly, mean-spirited Yorkshiremen who happen to have strayed in, will be prepared to do the same.

My aim tonight will be to ask and, more ambitiously, try to answer three questions about Britain's regional economies:

- *First*, how different are our regions in economic terms, both absolutely and by European standards?
- *Second*, what is happening to the relativities between regions? Are the inequalities becoming less or more

marked? Are some regions improving their living standards more than others and, if so, why?

- *Third*, insofar as there are differences between regions, why should we care? How important to economic policy-makers is it that they should understand regional trends? After all, there is only one short-term interest rate for the United Kingdom—and, perhaps, one day, for the whole of the European Union.

(Some of you may have noticed that, on Wednesday of this week, the European Commission (EC) published its own report on Europe's regions, designed to assess the impact of the so-called Cohesion Funds. I should emphasise that the coincidence of that report, and tonight's lecture, is entirely accidental. My figures are not drawn from that document, though—broadly—they do paint a very similar picture.)

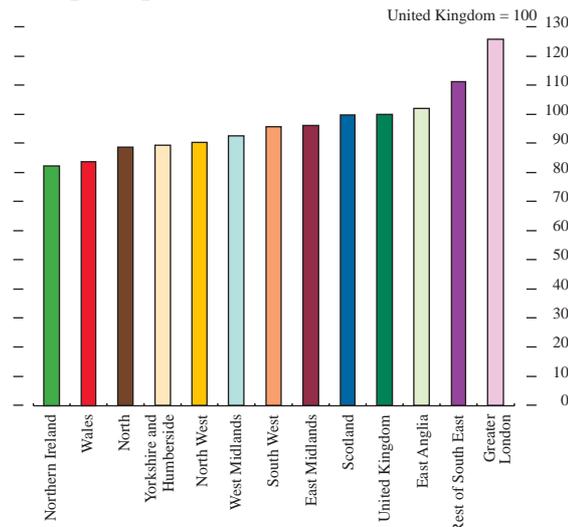
How unequal are the United Kingdom's regions?

Before I begin to look at differential economic performance, region by region, allow me to enter two caveats, at the outset. First, I plan to use the standard regional definitions used by the Office for National Statistics and others. You are, therefore, in the North, while I was born in the North West. These regions conceal significant differences within them. The distance between Wilmslow and Rochdale, where my mother lives, is, in some ways, as great as between Virginia Water and Darlington. But these regions are what we have to work with, in statistical terms. Second, some of the measures available, GDP per head or differential unemployment rates, are also not necessarily perfect expressions of prosperity. But, again, they are the raw material with which we must work.

With those caveats in mind, let us look at income, region by region. Some pictures will help greatly, here. The first (see Chart 1) shows the United Kingdom's regions

(1) In the Darlington Economic Lecture delivered on 8 November 1996.

Chart 1
GDP per capita in 1994

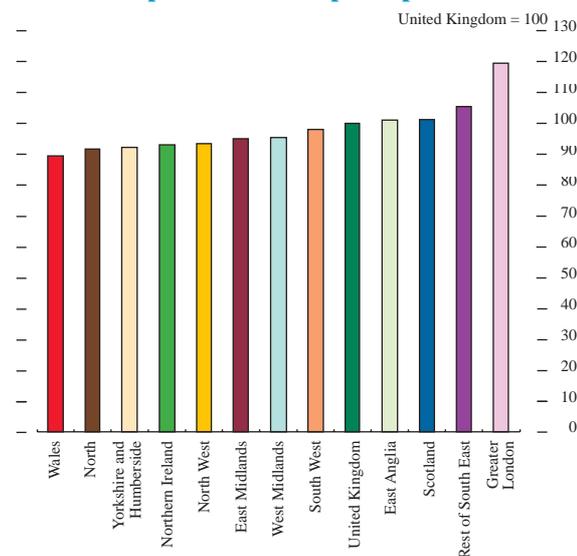


Source: *Economic Trends*, September 1996.

ranked by GDP per head in 1994, with Greater London proudly out front at 125% of the UK average, and Northern Ireland bottom of this particular league with 82%. Quite dramatic differences, you may think. And the Northern region is in the bottom third of the distribution. Indeed the North is, on this measure, the least prosperous region in England.

These differences are modified somewhat by the operation of the tax system which is, of course, modestly progressive. So if we look at personal disposable income per head (see Chart 2) we see that Greater London has slipped to 119% of the UK average and Wales, which now appears at the bottom of the league, is at 89%. The tax system squeezes the top and the bottom of this distribution. It may be, too, that living standards are not quite so different as these income figures suggest. They do not take account of the

Chart 2
Personal disposable income per capita in 1994

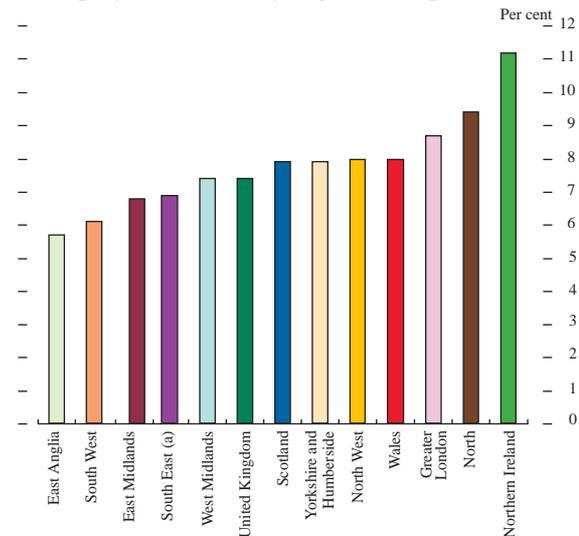


Source: *Economic Trends*, September 1996.

different, and generally higher cost of living in the South East.

Another way of looking at the relative position is through unemployment rates (see Chart 3), which are usually quite closely related to overall prosperity (though not perfectly). And here we can see that, on the most recent figures, UK unemployment averaged 7.4%, but ranged from 5.7% in East Anglia, the least affected region, up to 11.2% in Northern Ireland.⁽¹⁾ (These differentials, you will see, are

Chart 3
Unemployment rates by region in September 1996



Source: Office for National Statistics.

(a) South East includes Greater London.

not as large as the differentials in GDP per head might lead you to expect. There is an interesting lesson there to which I shall return a little later.)

But whichever way you measure them, these differentials do seem quite marked for a mature economy, with very open and flexible markets, and an economy in which successive governments have made strenuous and costly attempts to correct regional income differentials through a variety of regional policies, both domestic, and European. (We are now net recipients from the European Social Fund.) Of course many of the problems those regional policies have sought to address are long-lasting and deep seated. Regions which, like the North or Wales, experience the trauma of losing whole industries, like coal mining or ship building, are not easily resuscitated by a grant here, or a tax concession there.

This picture of differential prosperity again across the United Kingdom is, I would imagine, quite familiar to most of you. What is perhaps less well-known is how our regional differentials compare with those in other European countries. We hear, of course, some echoes of regional problems elsewhere through our media. We know about the problems within the unified Germany, and the relative impoverishment of the Eastern Länder. We hear of unrest in

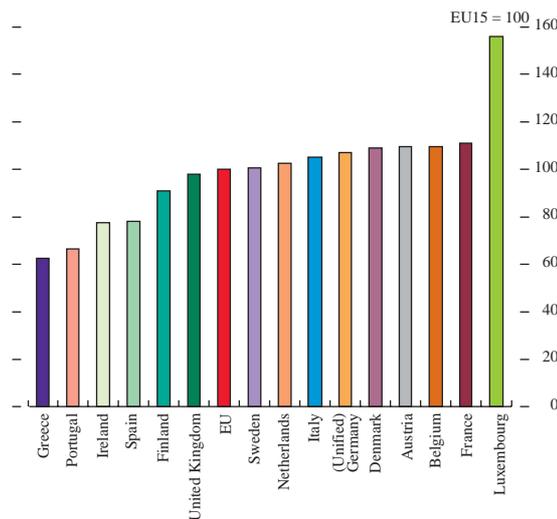
(1) Data available subsequent to this speech showed a fall in unemployment accompanied by a narrowing of regional differentials. In December 1996, the average unemployment rate for the United Kingdom fell to 6.7% and ranged from 5.2% in East Anglia up to 9.6% in Northern Ireland.

Corsica and of revolting farmers in distressed French agricultural areas. We know of tensions in Belgium: linguistic, but economic too. And most recently, we have noted the aggressive regionalism of the Lombardy League in the North of Italy. Signor Bossi has even gone as far as to propose the division of Italy on economic lines, with rich Padania in the North quickly joining a single currency bloc, while the impoverished South is left to its own devices.

But are these regional issues elsewhere in Europe as serious as our own?

Here we enter a statistician's wonderland. There are as many different ways of presenting these figures as there are Directorates General in the EU in Brussels. It is first worth looking at GDP per head by country, just to show the relative national positions, first. That shows a very wide range (see Chart 4) with Greece at the bottom and Luxembourg, right at the top. The German figures are of course brought down by the integration of the East. Without that, they would clearly have been above the French.

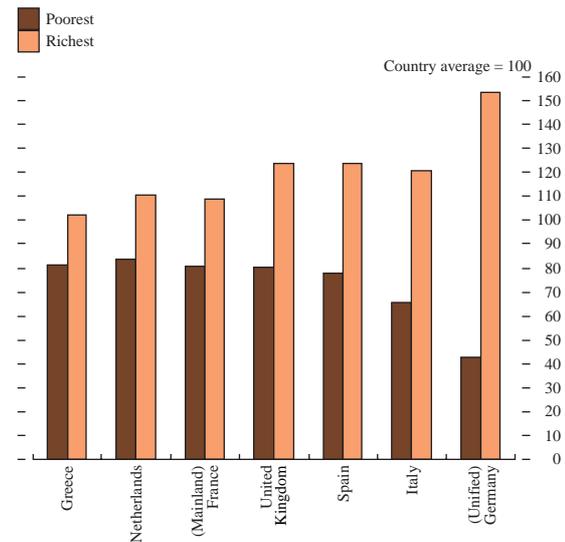
Chart 4
GDP per capita in the EU, average 1991–93



Source: EC data based on purchasing power parity exchange rates.

But we are most interested, in this context, in the differentials within countries, rather than between them. How is that best assessed? One approach is to take the five poorest areas (in the UK case that is Merseyside, South Yorkshire, Northern Ireland, Mid Wales and Cleveland and Durham) and the five most prosperous (Greater London, Grampian, Berks, Bucks and Oxon, Cumbria and Avon, Gloucester and Wiltshire) and show how far above and below the national average they are. You will see that on this measure, the United Kingdom does not look significantly more unequal than major other European countries (see Chart 5). The difference in GDP per head between Greater London and Merseyside is almost two to one. But the ratio is very similar between the Balearic Islands and the Extremadura in Spain. And it is larger between Lombardy and Calabria in Italy. And in the case of Germany, for the moment, the GDP per head ratio between Hamburg and Thuringia in the East is over four to one:

Chart 5
GDP per capita in the five poorest and richest regions, average 1991–93

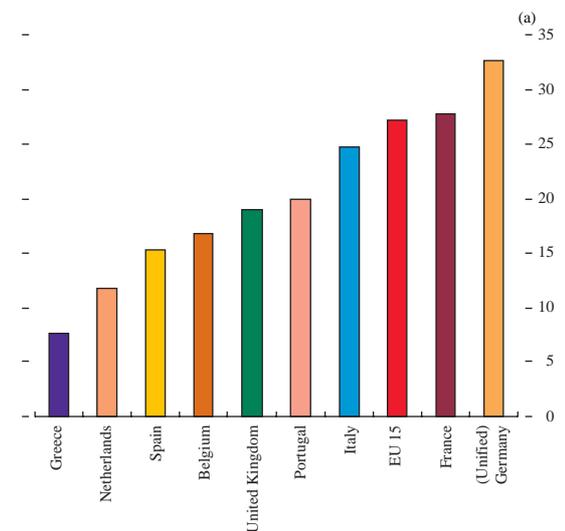


Source: European Commission.

though the Eastern Länder are in a special category, and are catching up quite rapidly.

One way of collapsing all this data into an overall measure of the regional differences is to use a measure of disparities in GDP per head by region, which, for the statisticians among you, weights the standard deviations between region by population. On this measure (see Chart 6) you will see that the United Kingdom is significantly less unequal than

Chart 6
Disparities in GDP per head by region within EU countries in 1993



Source: European Commission.

(a) Disparity measured as standard deviation weighted by population. Based on EU15 GDP per head = 100.

the average for all EU countries, though that average is somewhat influenced by the arrival of the East Germans. Nonetheless, even taking them out of the picture, the United Kingdom is less unequal, region by region, than West Germany, France or Italy. In Portugal the distribution of

income across regions is quite similar to that in the United Kingdom while Belgium, Greece, Spain and the Netherlands have a rather more equal distribution of income across regions. The Greeks are the poorest Europeans, but they are also the most evenly disadvantaged nation.

A slightly different picture appears if one looks at different unemployment rates by region. Unemployment differentials are rather greater in Spain and Italy. This seems to be reflected in the fact that very large regional transfer payments are made within those countries, payments which do not seem to be having a very significant effect on employment opportunities. In some of the other countries, notably France and Germany, regional differences in unemployment do not look quite as large as in the United Kingdom, though the differences are not dramatically great.

There is, of course, one obvious point to be made about these regional differentials in the whole of Europe. The differences are, in each country, around different averages. If you consider the European Union as one economic unit, then the differences between the richest and poorest regions in the Union as a whole are even more stark. The citizens of Hamburg, Europe's richest region, are almost five times as wealthy as those of the Alentejo in Portugal. This is an interesting point to consider, when we come on to think about how regional differences affect monetary policy within one country, and within Europe as a whole.

But this has been, so far, a static analysis. What is happening over time? It is a snapshot taken at one moment. Are these regional differentials widening, or the reverse? Are we seeing a gradual convergence, within the British economy, or within the European single market, or not?

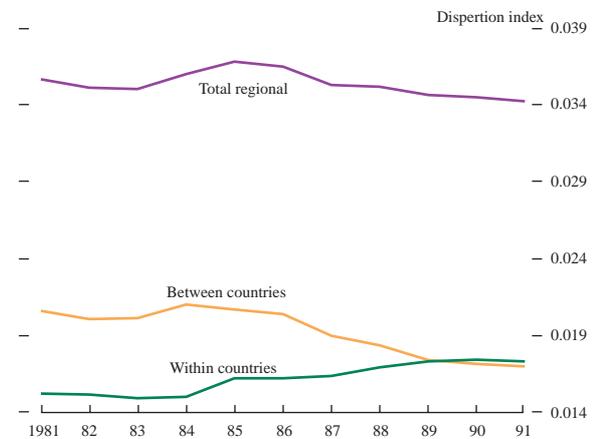
Regional differentials over time

First, a brief look at trends in the EU as a whole. In the period from the end of the last War up to 1974 there was a consistent and noticeable, albeit gradual, reduction in differentials between different EU countries. But the process of convergence came to a halt in the decade between the mid-1970s and the mid-1980s. That may in part be because the weak growth rate associated with successive sharp oil price rises, culminating in the world recessions of the mid-1970s and the early 1980s, made it harder to reduce income inequalities by redistributing GDP from richer to poorer states. It is always more difficult to share a shrinking cake.

Since the mid-1980s there has been some evidence of a return to gradual convergence in living standards between countries (see Chart 7). But this movement is not very firmly established and, over the period since the mid-1980s, the trend has been relatively weak. Furthermore, the convergence that has occurred is due mainly to improvements in the position of a few countries on the (geographical) periphery of the EU, like Ireland and Portugal, partly reflecting greatly improved economic management and their success in attracting inward

investment (certainly in the case of Ireland) and partly attributable to large transfer payments managed by the European Commission.

Chart 7
Regional disparities in the EU12: GDP per capita



Source: Eurostat. Dispersion measured using a Theil-type index. Reproduction of Figure 6, 'Regional Disparities in the EU12: GDP per capita' in Tony Dignam, 'Regional Disparities and Regional Policy in the European Union', *Oxford Review of Economic Policy*, Vol 11, No 2, summer 1995, page 80.

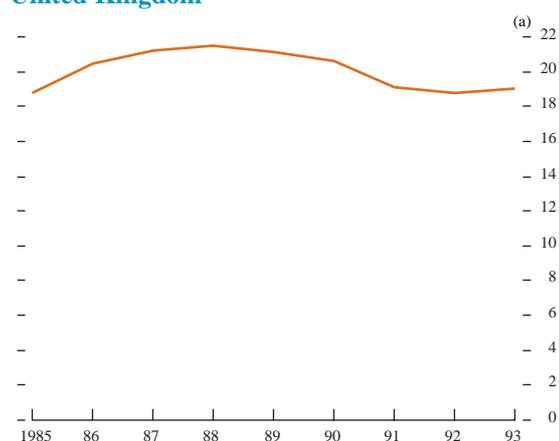
It is noticeable, though, on this measure of dispersion, that the dispersion of income across all regions of the EU has hardly shown any trend at all. And within countries, in Europe as a whole, regional differentials have, if anything, become slightly more marked. That is the meaning of the rising line at the bottom of the graph. It is interesting to note, in parenthesis, that the measure of dispersion here is almost the same within regions as it is between countries, suggesting that the Council of a European Central Bank trying to set monetary policy for Europe as a whole, would in one sense face a task rather similar to that faced in the United Kingdom in assessing the impact on regions with different standards of living. But the individual member governors on the Council would have had to reconcile the regional differences first, in producing their views. And of course the current 'national' monetary unions are much more closely integrated economies, with more robust fiscal safety mechanisms to respond to regional differences in income.

But has the United Kingdom shared this experience of rising regional inequality over the last couple of decades?

The short answer to that is no. And the most striking fact is that a weighted measure of income inequality across the United Kingdom has been remarkably constant over the past decade or so (see Chart 8). There was an increase in the late 1980s at the time of the most rapid expansion of the economy, which seemed to benefit the South East more than other regions, but since then things have gone back, if you like, to normal, and the measure of dispersion is almost exactly the same now as it was in the mid-1980s.

But this is not the whole story. And two interesting changes have occurred over the last couple of decades, which are suggestive in economic policy terms.

Chart 8
Regional disparity in GDP per head within the United Kingdom



Source: European Commission.

(a) Disparity measured as standard deviation weighted by population. Based on EU15 GDP per head = 100.

First, the regional league table has altered. The changes have not been as dramatic as those in the football league. Nothing as disagreeable as Manchester City's relegation from the Premier League has occurred. The South East remains at the top, and Wales and Northern Ireland remain at the bottom, just as they were in the early 1970s. And, sadly, we have to note that the Northern region remains the poorest English region today, just as it was 25 years ago. Darlington, too, remains in the Third Division, after a disappointing trip to the South East last May.

But you will see from Table A that there have been one or two interesting changes in relative positions. East Anglia has moved up from fifth to second place, and Scotland has moved even more sharply from seventh to third. The West Midlands has seen the sharpest decline from second to sixth

Table A
Ranking of regions by GDP per capita

	1971	1994
South East (includes Greater London)	1	1
East Anglia	5	2
Scotland	7	3
East Midlands	3	4
South West	6	5
West Midlands	2	6
North West	4	7
Yorkshire and Humberside	8	8
North	9	9
Wales	10	10
Northern Ireland	11	11

Source: Office for National Statistics.

and, more sadly from my point of view, the North West has similarly fallen back from fourth place to seventh. (The change in trend coincides almost exactly with my own move from Manchester to London but, as I recall it, I took very little GDP with me at the time.)

The most important reasons for these changes in relative position seem to lie in the different economic structures of the different regions. The North West's decline may be traced to the post-War problems of the textile industry. The

West Midlands was particularly hard hit by the deep recession in the manufacturing sector at the beginning of the 1980s. The share of manufacturing in the GDP of the Midlands, the North and North West and Wales is relatively high. The South East, by contrast, has a large services component in its economy and, until the most recent recession, that was a more favourable construction of GDP, from a growth perspective. The South East did suffer more acutely during the last recession, which is part of the reason why the overall dispersion of income has reduced, though the move was not sharp enough to alter its top position in the league table.

The *second* interesting point concerns the behaviour of unemployment over the last 20 years. Of course we know that, overall, unemployment has gone up. In fact, in the United Kingdom, uniquely among major European economies, the peak in unemployment during the last recession was lower than the peak in the previous one. This may reflect the impact of labour market reforms here in the 1980s. But looking at unemployment over a slightly longer horizon, we can see that in 1995 the rate was over two and a half times the rate in 1975.

That, however, is not my principal point. What I find more interesting, from a regional perspective, is that the variation in unemployment rates by region was higher in the mid-1970s than it is today (see Table B). In 1975 unemployment in the South East was 2.1%. In Northern Ireland it was two and a half times as high at 5.5%. It was twice as high in the North at 4.2%. Today, employment in the South East is 6.9% while in Northern Ireland it is 11.2% and in the North 9.4%. In statistical terms the amount of variation in unemployment rates by region is only around half, today, what it was 20 years ago.⁽¹⁾

Table B
Variation in unemployment rates by region over the past 20 years^(a)

Per cent	1975		1988		1992		Sept. 1996	
East Anglia	2.6	<i>9</i>	5.1	<i>11</i>	10.5	<i>4</i>	5.7	<i>11</i>
East Midlands	2.6	<i>9</i>	7.1	<i>8</i>	9.0	<i>11</i>	6.8	<i>9</i>
North	4.2	<i>2</i>	11.8	<i>2</i>	11.1	<i>2</i>	9.4	<i>2</i>
North West	4.0	<i>4</i>	10.3	<i>4</i>	10.6	<i>3</i>	8.0	<i>3</i>
Northern Ireland	5.5	<i>1</i>	15.0	<i>1</i>	13.8	<i>1</i>	11.2	<i>1</i>
Scotland	3.7	<i>5</i>	11.2	<i>3</i>	9.4	<i>8</i>	7.9	<i>5</i>
South East (includes Greater London)	2.1	<i>11</i>	5.3	<i>10</i>	9.2	<i>9</i>	6.9	<i>8</i>
South West	3.4	<i>6</i>	6.0	<i>9</i>	9.2	<i>9</i>	6.1	<i>10</i>
Wales	4.1	<i>3</i>	9.9	<i>5</i>	10.0	<i>6</i>	8.0	<i>3</i>
West Midlands	3.1	<i>7</i>	8.8	<i>7</i>	10.3	<i>5</i>	7.4	<i>7</i>
Yorkshire and Humberside	2.9	<i>8</i>	9.3	<i>6</i>	9.9	<i>7</i>	7.9	<i>5</i>
United Kingdom	3.1		8.0		9.7		7.4	

Source: Office for National Statistics.

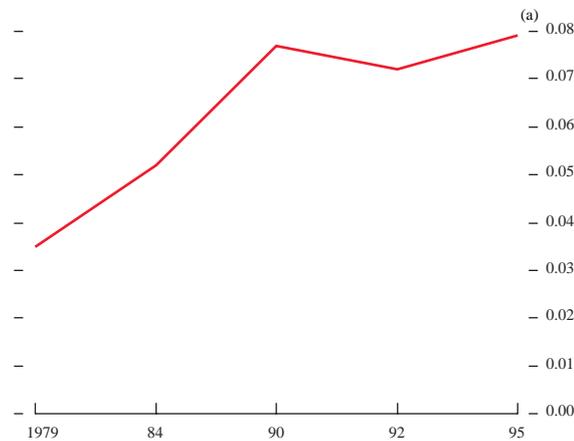
(a) Annual averages; figures in italics are the regional rankings of unemployment rates.

Why has this happened? The answer is not entirely clear, but one hypothesis which has something to commend it is that the shift is related to changes in earnings differentials, because average gross weekly earnings of full-time adult employees have become more unequal in regional terms, at the same time. In 1979, weekly earnings in the South East were about 8% higher than in the North. Last year

(1) Subsequent data covering annual averages for 1996 do not materially change the regional ranking of unemployment rates shown in Table B.

they were almost 30% higher. And if you look at the country as a whole, and express these differences as a co-efficient of variation, you will see that the spread is more than twice as wide now as it was at the end of the 1970s (see Chart 9).

Chart 9
Dispersion in average gross weekly earnings (£s) of full-time adult employees



Source: Office for National Statistics, excludes Northern Ireland.

(a) Dispersion measured as co-efficient of variation.

This change has resulted partly from changes to the pattern of earnings in different sectors. In the 1980s earnings in financial services rose more than the average, which drove up the relative earnings of the South East, with the large financial services component it has in its GDP. (And the City bonuses you read about are big enough, sometimes, to have an impact on the figures.) But there is obviously something else going on, too. This greater dispersion of earnings may be associated with a closer matching of pay to productivity and with structural changes in wage setting—for example, greater emphasis on local pay bargaining, so that local deals reflect differences in the cost of living (especially housing) from place to place. All of this is, if you like, evidence of greater flexibility in the labour market. Put simply, it would seem that employees, or potential employees in less favoured regions have, to some extent, priced themselves into work.

Whatever the reason, we have seen, particularly in the last few years, both a reduction in overall inequalities in living standards from one region to another, and a compression of unemployment rates. And these trends have occurred at a time when, as we have seen, in Europe as a whole, regional differences within countries have tended to increase, rather than to decrease. Will this new trend in the United Kingdom continue into the future? Ought I to skip a couple of lunches in the City next week, and buy a house in Darlington?

I would not wish to try to give you a forecast. Some crystal ball-gazers think that the wind is set fair for the North of England. A recent survey of foreign investors' perceptions showed that the North East was the number one region in Europe in terms of its attractiveness. Another survey chose

the North West as the most favoured location. But there are other less flattering views, too.

A recent study by the Henley Centre for Forecasting argues that the narrowing of regional disparities recently may be a temporary phenomenon and not the start of a permanent structural shift in favour of the North. The 1990s recession was associated with the bursting of the late 1980s housing and consumption bubble, which was most inflated in the South East. With that correction arguably now coming to an end, the Henley Centre suggests that the South may well begin to grow faster once again because it is better represented in those service industries which are likely to create the most wealth over the next few years: telecommunications, computers and financial services. Furthermore, they argue that although the North's economy is biased towards manufacturing, the manufacturing that does take place in the South has a far higher value per ton—which is one proxy measure for sophistication and high value added.

On this analysis East Anglia, for example, will grow most quickly in the next five years, while the North will grow less rapidly than the other English regions.

Will that happen? I do not know. And I have to say that I am somewhat suspicious of these deterministic analyses. I find it interesting that the North of England has done better than the North West in recent years in attracting inward investment and revitalising its manufacturing sector. This seems to me in part to reflect better regional organisation, and stronger regional determination to address economic problems.

So there is no inevitability about the future evolution of regional differentials. They may become wider, or narrower, and the direction of change will undoubtedly be influenced by the energies and skills of people in those regions.

But the last question I said I would address is, to put it bluntly, whether this matters for monetary policy, which is the Bank of England's core business. I should perhaps say that it is, rather, the Chancellor's core business. But we are his principal advisers. How far should we take account of regional differences in considering our policy advice? If we are only setting one interest rate for the whole of the United Kingdom, what sense does it make to think about regional differences before doing so?

The impact of regional trends on monetary policy

Some of you may be cunning enough to suspect that, if my answer was that we paid no attention whatsoever to regional differences in determining monetary policy, then I would not choose to deliver that message in Darlington. I would do so in the oak-panelled offices of a London merchant bank, or over the port in a livery hall. So you will not be surprised to learn that my short answer to this question is that it is indeed important for policy-makers to look at what is happening in

different regions, and that an understanding of regional development can improve the quality of the advice that we give to the Chancellor. But what justification can I offer for that view?

In general terms there are three principal, related reasons for the monetary authorities, and policy-makers more generally, to be more than casually interested in the question of regional disparities in economic performance.

The first, and perhaps most important reason, is that an examination of the differences between regions can improve our understanding of the nature of economic cycles, and of the effect various 'shocks', as economists call them, may have on the national economy.

When we try to assess the prospects of inflation, and to evaluate the impact of observed price changes, whether they will persist, and whether they will produce second-round effects elsewhere in the economy, we need to distinguish between shocks which come from the real side of the economy from those which arise from changes in monetary conditions. Real shocks may be increases or decreases in aggregate demand, or they may reflect changes on the supply side of the economy, such as a change in raw material prices or an increase or decrease in domestic productivity.

Some of these shocks, though they affect the whole economy, have a greater impact on some regions than on others because of the differences in industrial structure or demographic composition. For example, the impact of increased international competition on the car industry in the 1970s was felt particularly strongly in the West Midlands. By contrast, the effect of the liberalisation of financial services in the 1980s was strongest in the other direction—in the South East. Longer-term trends, such as the decline in shipbuilding and coal mining have clearly had a particularly fierce impact on South Wales and the North East. Technological changes that affect particular industries will similarly have different effects from one region to another. Scotland has become a region where trends in the IT industry have a marked impact.

Understanding these differential effects is not simply interesting, it provides greater insight into how the whole economy operates and therefore how it is likely to react to changes in policy at national level. We have learned—partly from our analysis of regional trends—that different industries are affected to a greater or lesser extent by changes in interest rates. It would appear that the construction and distribution sectors are most affected by a tightening of monetary policy, while the agricultural sector is the least affected. The East Midlands, the North and Scotland have relatively large construction sectors and, therefore, are likely to be disproportionately affected by changes in interest rates. On the other hand, East Anglia and Northern Ireland have a relatively high proportion of agriculture in their economies and may be less affected by a tightening of monetary conditions.

This leads into the second argument for the Bank to analyse regional trends. Regional patterns of economic activity may be affected by monetary policy. Monetary policy is directed at the objective of national price stability, but we need to take into account different behavioural patterns in different areas in assessing what degree of monetary tightness is appropriate to have the effect on inflation we want to see. The relatively high levels of personal sector debt in the South East may, for example, make households there more sensitive to interest changes than in the North or in Scotland, and therefore influence the path of the recovery.

That point has been of particular significance in the last three years. A disproportionate amount of negative equity in housing was concentrated in the South East. So house price rises in the South East have had a proportionately larger impact in reducing that negative equity, and creating conditions in which householders once again feel confident enough to increase their expenditure. We therefore watch regional movements in house prices.

Third, the picture we draw from a set of statistics from the whole economy is not independent of their regional composition, because the way the economy as a whole responds will be affected in a number of ways by the way in which those components are distributed. The inflation prospect is, of course, heavily influenced by the state of the labour market. If unemployment falls below what economists term its non-accelerating inflation rate of unemployment, then one can expect a stimulus to demand to be followed by an increase in wage rates and in inflation.

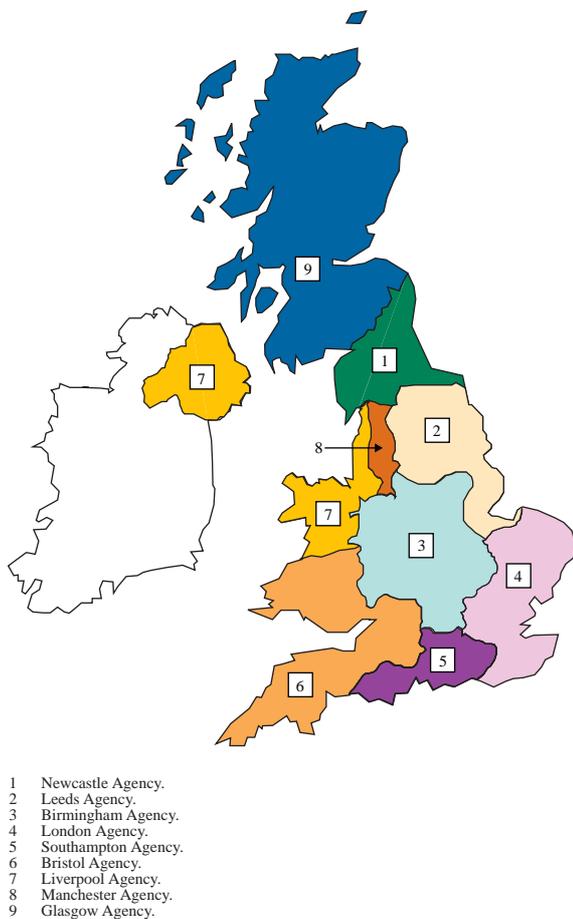
So it is important for us to take a view of the amount of slack in the labour market when giving our monetary policy advice. But of course labour is not perfectly mobile. Indeed we know that in the United Kingdom, labour mobility is still relatively restricted, for a number of reasons, notably the nature of the housing market. So we need to think not just about the overall level of unemployment, but also about its geographical spread. If there were no unemployment in the South East, but 15% in the North and North West, then an interest rate reduction, which would of course increase demand in the South East as well as in the depressed North, might generate more inflation than it would were that unemployment to be more widely spread. So when we look at unemployment we need to look at the 'match' between available labour and the likely demand for it. That means looking at the skill profile of the workforce, and the nature of the jobs available, but also at different regional circumstances.

Because we take this view, and attach increasing importance to understanding these forces at work in the economy, we have been taking steps recently to expand our regional coverage, through increasing the number and distribution of our agents. The Bank of England's agents are its eyes and ears in the regions. Of course, as I have done this evening, one can look at top level statistics on regional trends. But that is no substitute for having people on the ground who

can monitor economic activity directly. The very simple reason for that is that in delivering policy advice we are more concerned about the future than about the past. Our inflation target is couched in terms of the inflation rate 18 months or two years hence. So there is little point in our waiting until the Office for National Statistics have seasonally adjusted and smoothed the profile of growth region by region, which usually takes a year or two. We need to know what is happening now, and what local business people, local authorities and trades unions think about what will happen tomorrow. The agents do other jobs, too. They involve themselves in initiatives to improve the functioning of their local economy. Our Newcastle agent, for example, is helping with efforts to launch a Regional Investment Fund. But intelligence gathering is their number one task.

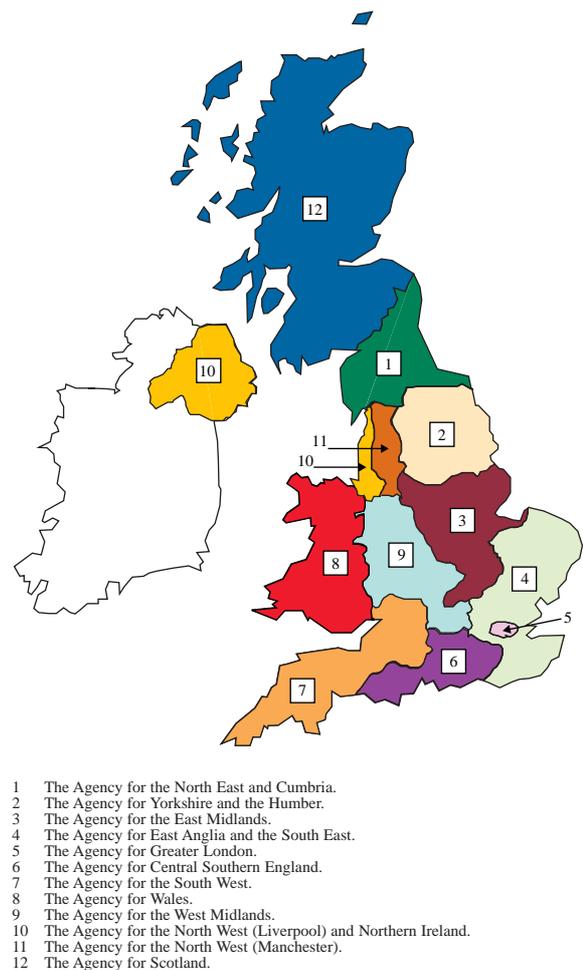
We already have agents in Glasgow, Newcastle (who covers this region), Leeds, Manchester, Liverpool, Bristol, Birmingham, Southampton and London. Between them, those agents visit around 4,000 companies each year to gather intelligence on their intentions, to complement the wider analysis of the economy undertaken by the Bank's economists in Threadneedle Street (see Charts 10 and 11).

Chart 10
Bank of England's previous Agency network



We now plan to extend that network, and to add a new office in Nottingham, to cover the East Midlands. In December we open in Cardiff, and a second office in

Chart 11
Bank of England's new Agency network



London—dividing our coverage of Greater London from the rest of the South East—and another smaller office in Cambridge to look at East Anglia will follow shortly after.

And as well as expanding the range of our network, we are also making the Bank's agents' work more visible. The agents already regularly report in to us on the regional economic situation. That forms part of our monthly assessment of inflationary conditions. We began in May to release a quarterly summary of the agents' analysis, partly so that other commentators could take a view on whether we were reporting accurately.

In this way we are seeking to produce, if you like, a UK version of what happens in Germany, or the United States. They are, of course, federal countries, which dictates the structure of their central banks. They, too, set only one interest rate, but their central banks devote considerable effort to understanding regional economic trends, nonetheless. In the United States, the regional Federal Reserve Banks publish regional analyses of the economies of their areas and send, by rotation, their presidents to Washington to contribute to monetary policy discussions. Similarly, in Germany, the presidents of the regional central banks are also represented on the Bundesbank Council. We do not, in this country, have a federal basis on which that representation can be built. But that does not absolve us

from the responsibility of understanding regional trends. So we are equipping ourselves, now, better to do so in the future.

Were we to find ourselves operating within a European monetary framework, as is possible—if not in 1999, then perhaps some time after that—then I believe we would still need to develop this broad regional view. Each president, or governor, of a central bank from a country part of the

central monetary union will be required to attend European Central Bank Council meetings in Frankfurt and to articulate a view of overall economic conditions in his or her member state. To do so properly will require comprehensive regional coverage, just as the assessment of domestic monetary conditions does today. So the network of intelligence gathering which we are now building will be useful no matter what monetary framework we find ourselves working within in the future.

Monetary stability: rhyme or reason?

Mervyn King, Executive Director and Chief Economist of the Bank, discusses⁽¹⁾ the importance of monetary stability. He argues that the period of post-war inflation has produced an inflation generation—a generation for whom inflation is the norm and affects every major economic decision. Mervyn King reviews the static and dynamic costs associated with inflation and concludes that the benefits of price stability are substantial.

Introduction⁽²⁾

Inflation in Britain is currently 2.9%. Twenty years ago it was 15%, and earlier in the 1970s it had been as high as 27%. Is inflation dead, or merely dormant? If dead, was it killed by a wave of creative destruction resulting from intense competition in world markets, was it murdered by contract killers chosen by an electorate disillusioned by the inflationary excesses of the 1970s, or did it simply commit suicide as inflation itself undermined the factors that had led to a sharp acceleration of prices? If dormant, is inflation likely to return to haunt a future government?

To understand the risks posed by inflation in the future, it is necessary to understand why inflation rose in the past. In the 1960s, the intellectual consensus was that moderate inflation was a recurrent feature of modern economic life, and, moreover, a little inflation was probably a good thing. Since then the views of economists and policy-makers have changed. Low inflation and balanced budgets are all the rage. Tonight I want to analyse the reasons for that new consensus by examining three questions. First, why did inflation rise in the post-war period? Second, does price stability matter? Third, how should monetary policy be set in Britain today?

Now, at this point you might well be wondering if this is going to be yet another lecture by a central banker on the boring virtues of stability. I am afraid the answer is—yes! Last week the *Daily Telegraph* remarked that to talk about the virtues of price stability required inspiration in order to lift the subject from the tedious to the merely dull. So in search of inspiration I went to the London Library. And there I stumbled upon a quite brilliant piece of polemical writing from 1933 by J R Jarvie entitled ‘The Old Lady Unveiled’. With such a promising title I had surely hit upon a winner. But I was taken aback by its opening words:

‘The object of this book is to awaken the public to the truth that the Bank of England, commonly

believed to be the most disinterested and patriotic of the Nation’s institutions, has been since its foundation during the reign of William of Orange a private and long-sustained effort in lucrative mumbo jumbo.’ (Jarvie, 1933 page 7)

Jarvie’s book was quite a discovery. Highly critical of the Bank, and scathing about the qualifications and careers of its directors, the work is not mentioned in any history of the Bank, nor in any relevant biography or bibliography, and nor was it known to anyone of my acquaintance.⁽³⁾ It has, in fact, been ignored by the Bank—until tonight. I am happy, after 63 years, to put matters right and give Jarvie his due.⁽⁴⁾ I should point out, however, that Jarvie was not overly impressed by economists:

‘If you want to find violence of language, go to the economists. No zealot, religious or political, can work himself up to such a white heat as a professor of the dismal science in defence of a theory.’ (page 75)

More of Jarvie later. But, suitably chastened, it is time to turn to the great post-war inflation and the experiences of what I shall call the inflation generation.

The inflation generation

The single most striking fact about the price level in Britain is its extraordinary rise in the post-war period. Chart 1 shows how unusual the great post-war inflation has been. No other period in our history has seen such a prolonged and rapid rise in prices. It has produced an inflation generation—a generation for whom inflation is the norm and which affects every major economic decision from the choice of career (does a job offer an index-linked pension?) to investment in housing (will inflation erode the real value of the mortgage?). Institutional arrangements have developed to cope with the uncertainty generated by an unstable and unpredictable inflation rate.

(1) In a speech given at the Economic and Social Research Council Seventh Annual Lecture, on Thursday 17 October 1996.

(2) I am indebted to Spencer Dale, Andrew Haldane and Neal Hatch for many helpful conversations as well as invaluable research support. As members of the inflation generation, I hope they will live to see sustained price stability in Britain.

(3) Who was J R Jarvie? And why was he so upset with the Bank of England? Was he, by any chance, related to the J Gibson Jarvie described as ‘an old friend of the Bank’ in the latest official history of the Bank? (Fforde, 1992, page 762).

(4) The book has some relevance today. He described in vivid detail the ‘heads I win, tails you lose’ manner of lending by UK investors to foreign sovereign borrowers, irrespective of their credit worthiness, who were later bailed out by the United Kingdom and other governments. The Austrian crisis of 1931 was especially on his mind, and there are clear parallels with the Mexican crisis of 1995. The recent G10 Deputies report on sovereign liquidity crises, produced in response to the Mexican experience, also contained an explicit warning that the major countries should and would not bail out private lenders.

The experience of the inflation generation can be seen by considering the cohort born in 1966 and who are celebrating their 30th birthday this month. Those young people have seen prices increase ten-fold during their life-times. The purchasing power of £1 when they were born has shrunk to only 10p. The inflation generation no longer has a stable monetary standard as Chart 1 shows only too clearly. The last time prices were no higher than a year earlier was March 1960. And since 1945, prices have risen more than twenty-fold.

Chart 1
UK price level



Sources: 1270–1850 ‘Seven centuries of the price of consumables, compared with builders wage-rates’, Phelps-Brown and Hopkins, *Economics*, November 1956; 1851–1914, ‘An introduction to the study of prices’, Layton and Crowther, Macmillan, 1938; 1915–95 Office for National Statistics.

Previous generations did not experience such sustained declines in the purchasing power of money, although there were, of course, fluctuations in prices with the ebb and flow of the trade cycle. Suppose that we were to stroll the few yards from this room down to the Embankment and to imagine that the price level was represented by the height of water in the River Thames. Variations in wind and weather lead to changes in the height of the water. In 1800 the Thames was approximately 8 feet deep. Between then and 1914, the prevailing economic weather led to movements in the height of the inflationary river. For most of the time the water depth was between 5 and 7 feet, and was never less than 4 feet and never more than 10 feet. Even under the stormy conditions of two world wars and the inflation and subsequent deflation of the inter-war period, the water depth never moved outside of a range of 6 to 13 feet, and by 1945 was 10 feet, only a little above the level in 1800. But from 1945 we have been out of our depth. The flood tide of price rises has led to the latest wave registering a depth of well over 200 feet, enough to swamp any craft that did not anticipate the impending inflation. Before the Second World War inflation was followed by deflation, returning the price level to its original level. To use the language of economics, for most of our history the price level was stationary—there were shocks, often violent ones, but no sustained upward trend. But in the post-war period the price level has been highly non-stationary.

Of course, inflation in Britain has never matched the levels that occurred in the European hyperinflations of the

inter-war period and, more recently, in Latin America, Israel and the former Soviet Union. In the most extreme hyperinflation, in Germany in 1923, the water, to use our analogy, reached a height of no less than 1,000 miles, which destroyed much of the economic and social fabric of the country. That experience of hyperinflation has not been repeated in the developed world. But ‘moderate inflation’ has been endemic. Table A shows the post-war inflation rate, by decade, in the G7 countries. Whereas hyperinflations contain the seeds of their own destruction

Table A
G7 inflation by decade^(a)

	1950s	1960s	1970s	1980s	1990–95
United Kingdom	4.3	3.5	12.7	6.9	4.6
United States	2.1	2.3	7.1	5.5	3.5
Japan	2.9	5.3	8.9	2.5	1.7
Germany	1.1	2.4	4.9	2.9	3.2
France	6.5	4.0	8.9	2.3	2.4
Italy	3.1	3.6	12.3	11.2	5.3
Canada	2.4	2.5	7.4	6.5	2.7

Source: International Historical Statistics 1750–88.

(a) Inflation is measured in terms of the consumer price index, except in the United Kingdom where RPIX is used, which excludes mortgage interest payments. The average inflation rate is calculated by comparing the level of the price index at the beginning and end of each decade.

(through currency substitution, for example), creeping inflation can persist. In the main industrial countries, after the immediate post-war reconstruction and the Korean war, inflation rose steadily, peaked in the 1970s, and has fallen, often painfully, subsequently. Only Germany can claim to have come close to price stability in the post-war period. That pattern is difficult to explain in any way other than as a response to the changing ideas of economists about the causes and consequences of inflation.

Given the shattering inter-war experience of both inflation and deflation it is interesting to ask why price stability was not central to post-war macroeconomic policy. After all, during the inter-war period leading economists, such as Maynard Keynes and Irving Fisher, drew the conclusion that it was sharp and unexpected movements of the price level—both up and down—that led to booms and depressions. Price stability, in their view, went hand in hand with stability of output and employment. So why did inflation rise in the post-war period? True, inflation crept up only slowly. In the 1950s it averaged around 4%, and that figure included the impact of the commodity price increases caused by the Korean war. But by the late 1950s the water had already reached a height of over 17 feet.

Economists of the time were not unaware of the water lapping around their feet. As early as 1959, Nicholas Kaldor delivered two public lectures at the London School of Economics. At the outset he stated that

‘the trend of rising prices has assumed an extent and a duration, in most of the advanced economies of the West, not previously encountered under peace-time conditions’. (Kaldor, 1959, page 212)

But Kaldor's objective was to argue against price stability. He looked at inflation in the context of a model of economic growth. That model contained two equilibrium conditions. The first was that, given a fixed propensity to save, the nominal rate of profit consistent with steady growth is proportional to the growth rate of nominal GDP. In an economy with a naturally low rate of growth, low inflation means a low rate of nominal GDP growth and hence a low rate of profit. The second equilibrium condition was that the rate of profit must be at least as great as the rate of return required by investors—the sum of the nominal interest rate and a risk premium. The problem was that the required rate of return had a floor under it, equal to the risk premium, because nominal interest rates could not fall below zero. Hence the required rate of return might exceed the rate of profit consistent with steady growth. Inflation was necessary to raise the nominal growth rate, and hence the profit rate, thus ensuring that equilibrium was compatible with growth. In Kaldor's view

‘a slow and steady rate of inflation provides a most powerful aid to the attainment of a steady rate of economic progress’.

The flaw in the argument is the implicit assumption that both the propensity to save out of nominal income and the required rate of return would not change with inflation. Yet in the 1970s that is exactly what happened—saving rates and bond yields rose with inflation. Kaldor's view that a little inflation each year is good for growth depended entirely on the ability of monetary authorities to fool investors and savers most of the time. As we have learned to our cost, that is not possible. More generally, the failure was to ignore inflation expectations as an important determinant of economic behaviour that would respond to changes in the monetary policy regime. It is surprising that those who professed to follow in the footsteps of Keynes ignored both money and expectations to such an extent.

Nowhere was the failure to think clearly about expectations more apparent than in some of the interpretations placed on the then recently discovered Phillips curve which related the rate of increase of earnings to unemployment. The existence of a short-term trade-off between inflation and unemployment, for a given set of inflation expectations, was translated into a belief in a permanent trade-off. Inflation was good for both output and employment. Chart 2 shows the Phillips curve in Britain for each decade in the post-war period. In most decades a short-term negative relationship is indeed apparent (apart from the 1960s and 1970s when both inflation and expectations were changing rapidly). But the final panel in Chart 2 shows the relationship for the period as a whole. No long-term trade off is apparent. As Friedman and Phelps argued in 1968, holding unemployment indefinitely below its natural rate can be achieved only by allowing inflation to accelerate faster than expected. But the lag between ideas and practice meant that the genie had already been let out of the bottle.

One obstacle to a more rapid change in the intellectual climate was that inflation itself did not rise quickly. During the 1960s it averaged only 32%. One of my vivid recollections as a student in Cambridge in the late 1960s was listening to the late Lord Kahn—Richard Kahn of the multiplier fame—trying to alert us to the dangers of ‘creeping inflation’. But the numbers were simply not big enough to jolt the consensus that inflation was the acceptable price of maintaining a high level of demand and employment. And, even when concern translated itself into action, it took the form of trying to suppress the symptom—by controls over wages through a series of incomes policies promoted by Conservative and Labour governments alike—rather than tackling the cause itself—too rapid a growth of nominal demand. One cannot blame politicians for these failures. Alec Cairncross' recent history of economic policy in the 1960s is an indictment of the intellectual framework provided by many economists to policy-makers at that time. It is impossible now to read Reginald Maudling's 1963 and 64 Budget speeches without a sense of impending doom. The Budgets were framed to achieve a target rate of growth of 4% a year—well above any previous experience of sustained growth—which, said the Chancellor, ‘can be attained, and attained without any strain upon our currency, if we as a nation have the will to achieve it’.⁽¹⁾ Even in the best of times the will of the nation is no substitute for monetary policy. Economic policy was based on a sort of inverse Say's law—supply would expand to meet the demand created for it.

That strategy ended in tears. Inflation in the 1970s cannot be blamed solely on supply shocks, especially the rise in oil prices. Inflation had already risen before those shocks occurred. By the early 1970s, underlying inflation was over 5% in the United States and even higher in Britain. There was a case for accommodating the oil price shock as a one-off rise in the price level. But, in the absence of a credible monetary regime, accommodating the shock meant that inflation expectations rose and it was impossible to resist the second-round effects on domestic wages and prices without substantial losses of output and employment. By then the costs of allowing inflation to rise were only too apparent. After the intellectual flights of fantasy of the 1960s, one is tempted to say that ‘economics was coming home’. But the benefits of returning to price stability were less clear. And the subsequent 20 years have been spent in trying to decide on how far inflation should be brought down. What should be the target for inflation? Does price stability matter?

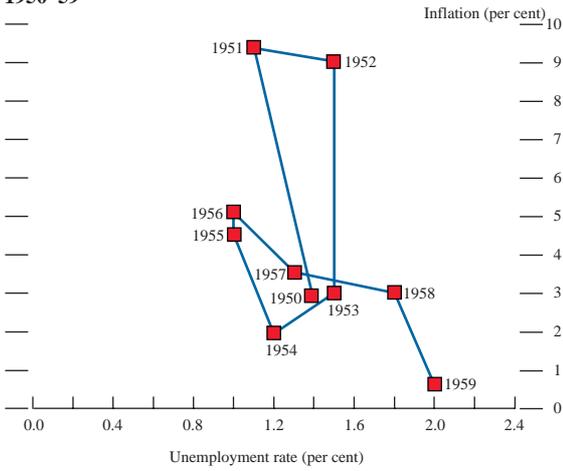
Does price stability matter?

A natural starting point is to ask households directly about the costs which they associate with inflation. Most of the survey evidence comes from North America. When inflation was at its peak in the 1970s and early 1980s it was seen as the number one problem facing the nation in the United States. Although its ranking has fallen subsequently, inflation still appears in more news stories than any other

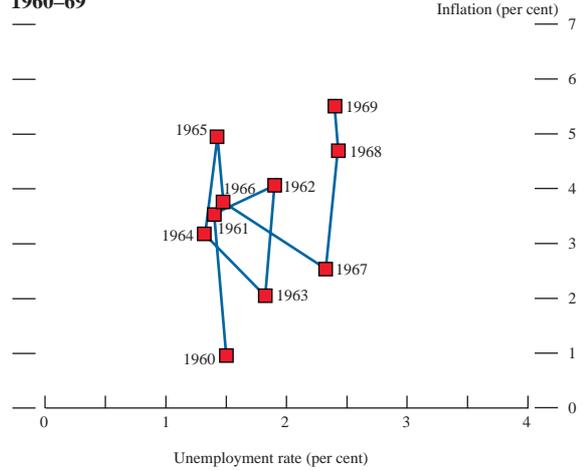
(1) Hansard, 3 April 1963, page 455.

Chart 2
The Phillips curve in the post-war period

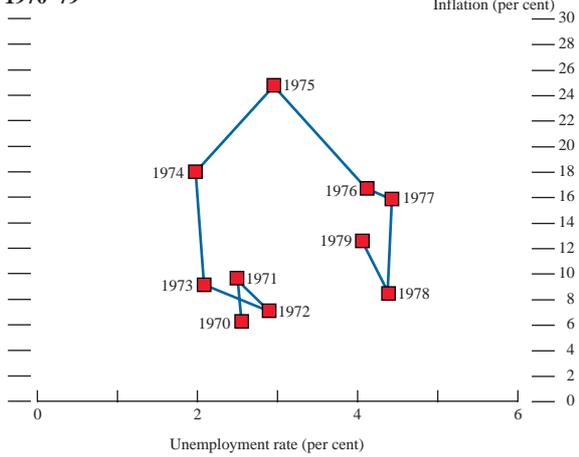
1950–59



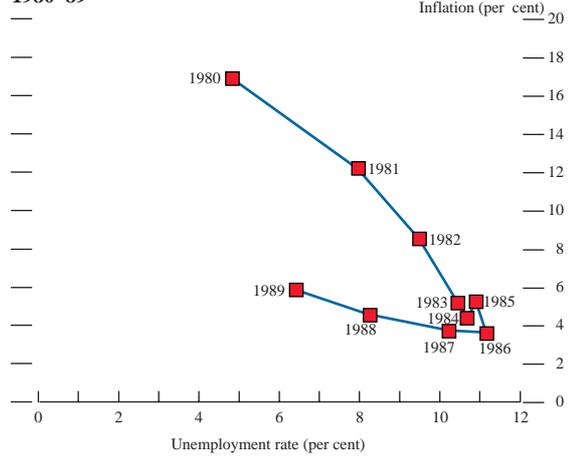
1960–69



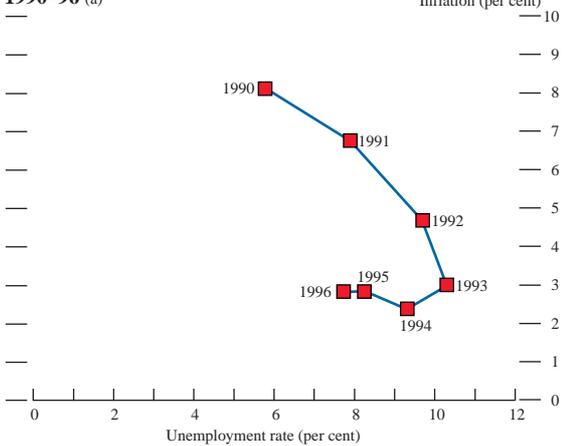
1970–79



1980–89

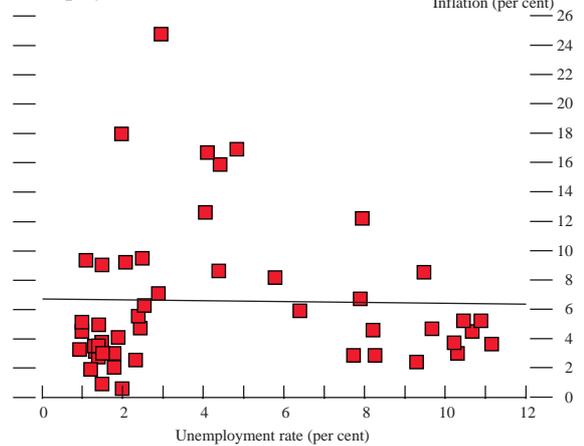


1990–96 (a)



(a) 1996 observation equals average of first eight months.

Unemployment and inflation: 1950–96 (a)



(a) 1996 observation equals average of first eight months.

economic term. The most detailed survey of attitudes toward inflation is that conducted by Robert Shiller (1996) in the United States, Germany and Brazil. Respondents were concerned about inflation for two reasons. First, inflation was seen as increasing uncertainty about their future standard of living. Second, inflation was thought to introduce an arbitrary element into income distribution and to lead to a loss of social cohesion. Indeed, political instability was seen by many respondents as highly correlated with inflation. These concerns are very different from those generally identified by economists as the costs of inflation, and I shall return to them later.

An economic assessment must look at both the static and dynamic costs of inflation. The former are concerned with the level of economic welfare and output, the latter with the rate of economic growth. The dynamic consequences I can deal with quickly. Empirical studies of the impact of inflation on growth in a large number of countries by Robert Barro and Stanley Fischer show that high inflation lowers growth. But at moderate inflation rates—below 10% a year—it is not possible to draw any firm conclusion about the relationship between inflation and growth because there is simply not enough variation in the data for industrial countries to enable us to detect the impact of small differences in inflation on long-run growth rates.

The static costs of inflation, however, can be shown to be substantial, even at moderate rates of inflation. These costs are of two kinds—those which result from fully anticipated inflation and those which are the consequence of unanticipated inflation. In turn, the former are of three types: ‘tax distortion’ effects, ‘inflation avoidance’ resource costs, and ‘menu costs’.

Taxes have distortionary effects. For most taxes, the impact of inflation on the tax system can be offset by adjusting the level of allowances and thresholds for higher rates each year. By and large our tax system does this, although chancellors have not been averse to deciding against indexation of thresholds in order to raise revenue. Much more serious is the measurement of income from capital. Despite indexation of capital gains, the tax treatment of income from capital is, broadly speaking, unindexed. Depreciation allowances do not take into account the higher replacement cost of purchasing capital goods to replace those wearing out, and both interest receipts and payments are calculated without taking into account the impact of inflation in eroding the real value of the principal. Effective tax rates on investment are, therefore, a function of the inflation rate—a property pointed out forcefully in the debate on fiscal neutrality in the 1980s.

Martin Feldstein has recently clarified the quantitative importance of these distortions to the tax system that arise even at low inflation rates. The reason why low inflation can generate large inefficiencies in the tax system is two-fold. First, an inflation rate of 3% is of a comparable magnitude to real rates of return on safe assets. With price stability and a tax rate of 50%, a real rate of return of 3% is

shared equally between the investor and the Inland Revenue. When inflation is 3%, the nominal and taxable rate of return rises to 6%. At a 50% tax rate, the real rate of return now accrues entirely to the Revenue and the investor receives a zero rate of return. In dealing with capital income low inflation rates matter. Second, given our current tax system, distortions would arise even with price stability. Hence a small increase in inflation does not move us from an efficient point to a slightly distorted situation. Instead, it increases a pre-existing distortion. That greatly magnifies the distortions that can be attributed to inflation—in the language of economists the welfare costs are measured not by triangles but by trapezoids.

How large are these costs? Feldstein calculated that in the United States a reduction in the inflation rate of two percentage points would result in a permanent addition to GNP of 1% a year. We have made some preliminary calculations along the same lines at the Bank of England. Partly because of the indexation of capital gains tax, the costs appear to be lower in the United Kingdom than the United States—roughly one half those estimated by Feldstein. But they are significant and will remain so in the absence of either a move to a personal and corporate cash-flow expenditure tax or complete indexation. There is no sign of the former, and the latter would be a practical nightmare.

The second type of cost I call the ‘inflation avoidance’ cost of inflation. It includes the traditional ‘shoe-leather’ costs of the reduction in the demand for real money balances which arise because attempts to economise on the use of cash involve spending time and resources in devising alternative means of making payments. More important, however, are the resources devoted to manipulating financial transactions in order to defer payments or accelerate receipts. Such rent-seeking behaviour is individually rational but collectively inefficient. Inflation increases the resources devoted to financial as opposed to real economic activity, as documented by Bill English (1996) of the Federal Reserve Board. In the same way as resources devoted to tax avoidance are a pure waste from the point of view of society as a whole, so also are the resources devoted to inflation avoidance in the private sector. And they are completely avoidable if the government maintains a stable price level.

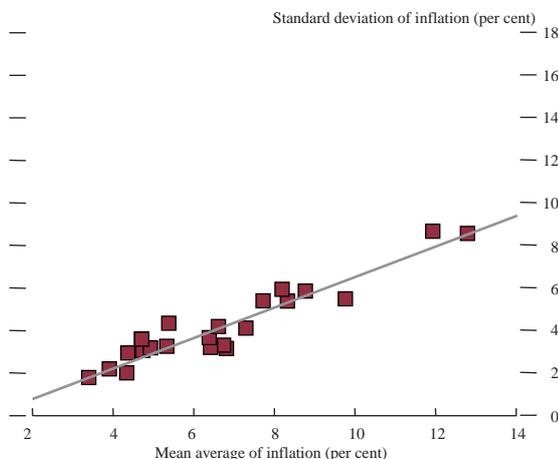
The third cost is that of revising quoted prices and contracts when inflation is positive—‘menu costs’ as economists call them. Such costs do not seem to be very important. In a survey of pricing behaviour by UK firms, the Bank of England found that only 7% of firms felt menu costs were important. A typical firm in Britain changes its prices about twice a year. That may be frequent enough to avoid significant distortions in relative prices but infrequent enough to prevent the costs of changing prices themselves from becoming significant.

Taking these together, I would suggest that inflation avoidance activities in the form of rent-seeking behaviour and the interaction between inflation and an unindexed tax

base for income from capital constitute the major costs of anticipated inflation. Feldstein and others have argued that costs of this order are more than sufficient to outweigh the output costs involved in bringing inflation down to price stability. In that calculus, the cost is temporary and the benefits are permanent. Others believe that such a calculation is artificial. How is it possible to ensure that the reduction in inflation is permanent? Would the acceptance of a sacrifice of output today guarantee future price stability? Fortunately, inflation in Britain today is closer to price stability than for a very long time. The required fall in inflation to bring us towards a measured inflation rate of 2% a year—often associated with price stability—is small. What is most important is that we capture the real benefits of price stability by ensuring that inflation does not rise to levels from which only a costly recession could return us to price stability.

That proposition leads directly to the costs associated with uncertain and variable inflation. That there is a positive correlation between the level of inflation and its variability is clear from Chart 3. It plots the standard deviation of inflation against the average inflation rate for the OECD member countries over the period 1960–92.⁽¹⁾ In principle,

Chart 3
Inflation and inflation uncertainty in OECD countries 1960–92^(a)



Source: International Financial Statistics.

(a) Excludes Czech Republic, Iceland, Mexico and Turkey.

there is no reason why a rise in the average inflation rate should necessarily increase its variability. Why then is the positive correlation so strong? The reason, I think, is to do with expectations. A commitment to an inflation target equivalent to price stability is a clear statement that the government believes inflation has real costs. It is credible. A commitment to a constant inflation rate of, say, 5% a year is not. The public would probably believe that if the authorities were prepared to live with 5% inflation they would have little difficulty in accepting 6% inflation. As a result, a positive inflation shock would raise expected inflation thus making it much more costly for the authorities to return inflation to 5%. It would then be rational for the

authorities to let inflation vary. In contrast, a commitment to price stability would make it more likely that the public would not change their expected rate of inflation in the face of a positive inflation shock. Such a shock would be assumed to be temporary. A credible commitment to price stability allows the monetary authorities to reduce the output costs of holding inflation constant.

Inflation volatility generates three types of costs. The first is that uncertain inflation introduces an inflation risk premium into long-term interest rates. Risk averse investors need to be compensated for bearing the inflation risk. A comparison of yields on conventional and index-linked bonds provides information on expected inflation and the inflation risk premium. If inflation expectations were in line with the actual outturn for inflation over the past decade then the inflation risk premium could be estimated from the holding period returns on the two types of bond. That estimate is of the order of 50 basis points—not trivial in comparison with real rates of return. An increase in the real cost of capital resulting from an inflation risk premium lowers the equilibrium capital stock and productivity. That is costly in an economy which exhibits a low saving rate and inadequate investment. But far more research will be needed to identify the premium with any accuracy.

Second, the greater the uncertainty about inflation, the more difficult it becomes to distinguish relative from absolute price changes. The additional noise introduced by volatility of the average price level reduces the value of the price signals transmitted to consumers and producers alike. Such volatility is destructive not creative. It is not difficult to believe that variable inflation in the 1970s and 1980s made it harder to distinguish relative and absolute changes in house prices, with all the consequences for investment in property and mortgage commitments that proved so costly in the 1990s.

Third, uncertainty about inflation is likely to increase the volatility of real output and employment. In theory, it would be possible for an omniscient central bank to create price surprises designed to offset the supply shocks which hit the economy from time to time. In that way, real output and employment could grow steadily. And there is a role for monetary policy to react to such shocks. But central banks are not omniscient, and an unpredictable monetary policy designed to generate price surprises is likely to exacerbate fluctuations in output and employment. Those cyclical fluctuations matter—both because they may influence the trend itself and because they fall unevenly on different industries and individuals.

The final cost of inflation is structural. A world of price stability, in which there is a stable standard of value, is very different from one in which money values are unpredictable. That unpredictability tells us something about how our government works. It relates to the concerns of the

(1) The chart excludes the Czech Republic, Iceland, Mexico and Turkey, all of which experienced periods of extremely high inflation (100% a year or more).

respondents in Shiller's survey. If the Met Office changed its measure of temperature, it might take several months before we realised that Britain was not getting warmer and that weather forecasts were even more unreliable than we thought. Moreover, holiday brochures would have to be reprinted so as not to mislead people about the weather they could expect and their brochures would no longer be trusted unless we knew exactly when they had been written. We would lose confidence in the official measure of temperature. So it is with money. It is a stable standard of value and not inflation which oils the wheels of economic activity. The inflation generation to which I referred earlier did not grow up in a world of price stability. That has affected their choice of careers, their investment in housing, their wealth, and their attitude to wage bargaining. The cost-benefit analysis of a move to price stability is really about such structural changes.

Before concluding, I should touch on two arguments against price stability. Neither are new, but they have attracted some distinguished academic support in recent years. The first is that because there is downward rigidity in nominal wages, a low rate of inflation prevents a real wage adjustment that may be needed following shocks to the demand for different types of labour. Akerlof, Dickens and Perry (1996) have argued that the existence of nominal wage rigidity means that at very low rates of inflation there is a permanent trade-off between inflation and employment. The empirical evidence is inconclusive because there is little modern experience of price stability. A move to price stability would be a change of regime that, in itself, would make downward wage rigidity less likely. Money illusion is, after all, just that. It is quite different from rigidity in real wages. And low inflation has not prevented the United Kingdom and the United States from experiencing falling unemployment over the past four years.

Two further remarks are relevant to the Akerlof *et al* hypothesis. First, the existence of (a) positive aggregate productivity growth and (b) the fact that, because official price indexes do not adequately take into account changes in the quality of goods and services, price stability corresponds to a measured inflation rate of some 1% to 2% a year, means that there is in fact quite a lot of scope for real wages to fall, even if nominal wages are inflexible downwards. Indeed, an operational inflation target corresponding to price stability should allow average nominal wage growth of 3% to 4% a year which erodes much of the force of Akerlof's argument. Second, since labour can move from one firm to another, what matters is less shocks to the demand for individual firms' products and more the derived demand for particular types of labour. Changes in relative real wages appear to reflect less cyclical fluctuations in demand and more trend changes in skill levels. The fall in real wages of the unskilled that we have seen in the past 20 years could have quite easily been accommodated in a world of price stability. To believe that nominal wage rigidity would permanently raise unemployment is to place a great deal of weight on the very money illusion which price stability is designed to overcome.

The second argument against price stability is that since nominal interest rates cannot fall below zero, an expected inflation rate close to zero means that real interest rates cannot be negative. At various points in the economic cycle, negative real interest rates might be necessary to stimulate economic recovery. Unlike Kaldor's argument, this one is based on the assumption that the private sector reacts rationally to changes in the monetary policy regime. The argument, put forward by Larry Summers (1991), has not been subject to systematic assessment. It is true that in Japan, where prices have if anything been falling, official short-term interest rates have fallen very close to zero. But it is debatable whether any further relaxation of monetary policy in Japan would have been better implemented by negative real interest rates now as opposed to a reduction in real interest rates earlier in the cycle. And most of the examples of the need for negative real interest rates relate to recessions caused by earlier monetary policy mistakes. A stable monetary policy might well reduce the magnitude of the boom and bust cycle, thus reducing—if not eliminating—the need for negative real interest rates.

In my view, these objections to price stability do not outweigh the advantages of a stable monetary standard. But there is one other, rather common, reaction to the proposition that monetary policy should be directed toward price stability. That is the view that setting price stability as the overriding objective of monetary policy means paying insufficient attention to the real economy. I believe that view to be false. But it is easy to see why it has gained currency. Disinflation in Europe has been accompanied by rises in unemployment to a level previously unimaginable—there are 18 million unemployed people in the European Union—and with little immediate prospect of substantial improvement. Central banks have been coy about discussing the link between monetary policy and unemployment. The fact that there is no long-run trade-off between inflation and output does not mean that there is no link in the short run.

The short run can, of course, last for many years. That was the essence of the criticism of the Bank of England in the inter-war period in its pursuit of a return to the gold standard. The wish to return to a monetary regime that had proved enduring and credible was not foolish. That judgment looks a good deal better today than it did to the Bank's critics given the frequency with which we have changed the monetary policy regime since the war. But it was a mistake to confuse the choice of regime with the particular parity at which sterling returned to the gold standard. The reputation of the Bank of England, and Montagu Norman in particular, suffered as a result. During that period, Montagu Norman often travelled abroad under an assumed name and, when visiting the United States in 1932, he adopted the disguise of Professor Clarence Skinner. Our friend Mr Jarvie had some harsh words about this episode:

"To many straight-laced people the [use of the title] "Professor" was bordering on the dubious. It is an

offense to use a degree to which you are not entitled, and while professorship is as often as not an honorary designation, being legitimately adopted by unqualified singing masters, boxing instructors and the more elegant vendors of pills in market-places, the unearned professorship of Mr Montagu Norman was, I have the strongest reasons for divulging, frowned upon in the best University circles, excluding the London School of Economics.’ (Jarvie, 1933 page 104)

In some of the best university circles, concern has been expressed that the pursuit of an inflation target may imply excessive volatility of output and employment. I do not believe that to be true.

The existence of a Phillips curve, albeit unstable, leads to a long-run trade-off between the volatility of inflation and the volatility of output. A central bank can take countercyclical actions to reduce fluctuations in output, at the cost of accepting slightly higher volatility of inflation, provided that such actions do not alter inflationary expectations and hence build in a potential inflationary bias. It is precisely the absence of a credible commitment to price stability which has meant that, over the past 20 years, any accommodation of an upward shock to inflation has raised inflation expectations and increased the output cost of meeting low inflation in the long run. A central bank that does not have credibility cannot afford to engage in as much flexibility in monetary policy as can a central bank which has established a track record for a commitment to low inflation. When credibility has been attained then year-to-year fluctuations in inflation are less important. That can be seen by a comparison between the volatility of inflation in the nineteenth century, when the price level was stationary, and the volatility in the post-war period when, as we have seen, the price level was highly non-stationary. Table B shows the standard deviation of annual changes in inflation and of changes in average inflation rates over ten-year periods. It

Table B
Two inflationary regimes

		Average inflation rate (a)	Standard deviation	Standard deviation over a ten-year horizon (b)
United Kingdom	1801–1904	-0.33	6.78	1.50
	1950–86	7.08	5.42	3.82
United States	1801–1904	-0.45	5.79	2.30
	1950–86	4.20	3.59	2.39
France	1816–1904	0.45	8.77	1.52
	1950–86	6.98	4.50	2.49

Source: International Historical Statistics.

- (a) Inflation is measured by annual changes in the wholesale price index. The greater stability of the basket of goods considered by the wholesale price index, compared with cost of living indices, aids historical and cross-country comparisons.
- (b) Measures the standard deviation of the average rate of inflation in the ten-year period following the observation year. For example, the observation for 1986 refers to the average rate of inflation in the ten-year period 1986–95.

can be seen that although average inflation was higher in the post-war period, the standard deviation of annual changes in inflation was actually lower than in the nineteenth century. But the reverse is true for the standard deviation of changes in inflation over ten-year periods. A world of price stability

is one in which the price level in the medium term is predictable, even though there may be year-to-year fluctuations in inflation.

Any central bank that wishes to accommodate temporary shocks to inflation must ensure that private sector agents understand its motives and accept the reasoning for its policy. If the markets suspect that the central bank is not fully committed to its inflation target then the outcome will be either a rise in inflation or a larger loss of output. Transparency and openness of the central bank’s actions are a natural partner to its commitment to low inflation and a countercyclical use of monetary policy. There is much greater transparency of monetary policy now than in the days of Montagu Norman. The conversations between Chancellor and Governor are among the most highly documented relationships of our time. Contrast this with the inter-war period. In October 1932, writing in the columns of *The Spectator*, Philip Snowden, the former Chancellor of the Exchequer, wrote about the relationship between Chancellor and Governor.

‘The relations between the Chancellor and the Governor of the Bank are intimate and confidential. What takes place between us is inviolable as if under the seal of the confessional.’

The minutes of this particular confessional are now published once a month. Our friend, Mr Jarvie was outraged by Snowden’s statement.

‘Isn’t it damned insolence when you think of it? Why the secrecy? Why the inviolability? ... Lord Snowden did not retire a day too early.’ (page 131)

Mr Jarvie’s day has come.

Conclusions

The benefits of price stability—by which I mean a rate of inflation sufficiently low and sufficiently stable that it does not affect economic decisions—are substantial. Estimates of the cost of anticipated inflation are, as recent research has shown, potentially large and sufficient to outweigh the cost of a carefully designed transition to price stability. The costs of unanticipated inflation are less tangible but potentially more important. Uncertainty about future inflation reflects a concern about the consistency of government policy. That is why inflation is correlated with inflation uncertainty, and why both, if sufficiently high, can be shown statistically to lower growth rates. Inflation is a symptom of a country that cannot come to terms with its own budget constraint.

Inflation is also an unnecessary problem. There are far more important real economic problems which face us. Few people enter politics to keep inflation low. Nor should we expect them to do so. Price stability should be part of our economic constitution, common to all parties, providing a degree of macroeconomic stability to enable governments to

devote both the time and energy to debate the great issues of the day.

I have argued tonight that price stability is the *raison d'être* of central banks. Price stability is a timeless virtue. And the pursuit of price stability does not prevent the use of monetary policy to reduce fluctuations of output and employment.

The inflation rate in October 1996 is likely to be almost the same as that in October 1986. We have yet to achieve price stability, and yet to prove that we can combine it with economic growth. Both theory and history suggest that it is within our grasp provided that we continue to pursue consistently a suitable inflation target. In the 1930s, Fisher and Keynes argued that monetary stability was crucial for stability of the economy. And, at the same time, the target of Jarvie's polemic was that the institution responsible for monetary stability should be accountable to the public. Monetary stability, on the one hand, and transparency and accountability, on the other, go hand in hand. As a country, we have travelled a long way since the mistakes of the 1960s and 1970s. But that does not mean that we have reached our destination. On monetary stability, the test is not whether inflation is below a certain number on a particular date. It is whether the regime of monetary policy leads to the widespread expectation that inflation will not be a relevant factor in economic decisions in the future.

Accountability means that a modern central bank must be open about its actions and its motives. It must explain its ideas. It will make mistakes. But if it wishes to be judged by the public on a fair and honest basis, it must forsake mystique and mumbo jumbo for transparency and openness. It must not forget that its main purpose is to be a rock of stability, not a source of excitement. In an era when, to paraphrase Andy Warhol, policies are famous for fifteen minutes, a central bank must not be afraid to eschew distractions and focus on the single objective of price stability. It is difficult to better the words of T S Eliot from *The Rock*

The endless cycle of idea and action,
Endless invention, endless experiment,
Brings knowledge of motion, but not of stillness;
Knowledge of speech, but not of silence;

..

Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?

If I invoke Eliot you may think that the case for price stability is more rhyme than reason. But I hope that I have convinced some of you that monetary stability is not just a mantra of central bankers. It is the talisman of honest government and a successful economy. It is in fact not rhyme but reason.

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Evolution of the monetary framework

The Governor reviews⁽¹⁾ developments in the monetary policy framework since the first Loughborough Lecture on financial change and broad money, given by Robin Leigh-Pemberton ten years ago. The Governor describes the immediate aftermath of the abandonment of broad money targeting, and the United Kingdom's experience with exchange rate targeting including the ERM. Finally, he describes the present monetary framework, based on an inflation target, and the role of the Bank of England in it.

Introduction

I am delighted to return to Loughborough this evening to deliver this year's Loughborough University Banking Lecture.

I remember, very well, the occasion of the first Loughborough Lecture ten years ago delivered by my predecessor, Robin Leigh-Pemberton, now Lord Kingsdown. That original lecture had the somewhat technical title 'Financial change and broad money'. As that title suggests, it was not much about the broad objectives of monetary policy. It was about the operational framework for conducting monetary policy. It described in particular the problems we had experienced with a policy framework based largely on intermediate targets for broad money during a period of rapid change in financial behaviour.

Those problems had arisen because the short-term relationship between the broad monetary aggregates and inflation had not been sufficiently robust to serve as a reliable guide to policy. Important changes to the monetary framework then followed: the exchange rate became an increasing focus of policy in 1987 and it became the explicit policy anchor with our entry into the ERM in 1990; then, in 1992, when we were driven out of the ERM, we moved to the present policy framework of an explicit inflation target.

My lecture this evening will follow on from that of my predecessor and explain how and why the monetary framework has evolved in this way. I will also explain the present framework in some detail.

The final objective of monetary policy

But before I embark on that let me just emphasise at the outset that however much the operational policy framework has changed—and there are considerable differences between the way we sought to implement policy then and now—the final objective of policy has *not* changed.

To quote from that earlier lecture:

'The fundamental objective of policy remains . . . to squeeze out inflation progressively and to create a stable basis for

the operation of the economy. That is the contribution towards the achievement of wider national economic goals that is to be looked for from monetary policy'.

I am happy to stick with that statement today—indeed in substance it is now very much the received wisdom both internationally and across much of the political spectrum within countries.

The underlying point is that inflation reflects emerging imbalance between monetary demand and the capacity of the economy to meet that demand. It generates uncertainty as to how far it will go, how long it will last, and what action will ultimately be needed to bring it under control. That uncertainty distorts savings and investment decisions—which tend to place excessive weight on the short term; and it obscures the relative price signals that are necessary to efficient resource allocation. So it damages our long-term economic performance.

That in brief is the substance behind the central bankers' mantra—that control of inflation is a necessary condition for sustainable growth, and the biggest contribution that monetary policy can make to our long-term economic performance. But it is important to recognise that 'controlling inflation' is in effect short-hand for seeking to preserve economic stability (avoid imbalance between demand and supply) in a much broader sense.

The policy framework from 1986 to 1992

I will take this objective as given in the rest of my lecture. The question I want to come on to is how we try to achieve it.

Monetary targeting to discretion

Let me begin by referring back to the breakdown of the framework of monetary targets which had spanned the late-1970s to mid-1980s. It is important to remember that in terms of the final objective—bringing down inflation—policy was actually reasonably successful during this period. The difficulty we had was in controlling the monetary aggregates themselves, which was supposed to be the intermediate stage in controlling inflation. In practice,

(1) In a lecture given at Loughborough University on Thursday, 7 November 1996.

against the background of financial deregulation and related changes to financial behaviour, and despite making frequent changes to the precise form of the targets, we had repeatedly to over-ride the message the monetary aggregates appeared to be giving. One might think that this would not have mattered if the final objective was being achieved. In one sense this is right. The problem was that our repeated failure to achieve the intermediate targets undermined public confidence in the policy framework as a whole, including our continuing commitment to low inflation, and that clearly was important given that the final objective was to reduce uncertainty about the future.

We had in fact effectively given up the attempt to find a stable short-term relationship between money growth and nominal income or inflation, which could provide us with a reliable guide to policy by the time of the first Loughborough Lecture. And although we have continued ever since to monitor very closely the behaviour of all the monetary—and credit—aggregates, including the sectoral breakdown between persons, industrial and commercial companies and other financial institutions, for what insights they can give us to the behaviour of the economy, formal broad monetary targets were abandoned in the 1987 Medium Term Financial Strategy (MTFS). A target was retained for narrow money and we continued as I say to monitor broad money, but relatively more emphasis than before was placed on a range of other indicators, including the exchange rate and the growth of money income (nominal GDP). In effect, this more eclectic approach—in practice we looked at a wide range of both real economic and monetary and financial evidence—merely confirmed what we had been doing already, and it foreshadowed in many ways our current approach. But coming in the wake of a regime in which there had been an explicit intermediate broad money target, which purported to be of special importance, this approach led to confusion as to which indicator we attached particular weight to at any particular time.

Discretion to the exchange rate

This perceived lack of clarity was difficult to sustain, and there was a continuing instinct to develop a new monetary policy rule. Quite soon, through the summer of 1987, the exchange rate came to dominate policy. The idea essentially was that, just as other major European countries were successfully aiming to hold inflation down by anchoring their currencies to the Deutsche Mark through the ERM, we too could ‘lock in’ to Germany’s enviable record of sustained low inflation even without actually becoming a member of the mechanism. This approach of ‘shadowing the Deutsche Mark’ was never formally adopted or announced, but it became clear in practice that our exchange rate against the Deutsche Mark, which had fallen very sharply, from DM 4.00 in July 1985 to DM 2.74 at the beginning of February 1987 before the election in May, was not subsequently to be allowed to recover to above DM 3.00, even though this meant cutting interest rates, by

2.5% in 1987 (from 11% to 8.5% by January 1988), in order to prevent it.

I don’t suggest that this was the only influence on policy over this period, which covered the stock market crash, for example. But it was certainly an important influence. It had the effect of accommodating the inflationary consequences of the earlier depreciation—indeed of aggravating those effects by loosening monetary policy and stimulating domestic demand.

By the time that the exchange rate cap was lifted, in the spring of 1988, and we reverted to a more discretionary policy, the boom was already well in train. It took until October 1989, by which time interest rates had been doubled to 15%, to bring the situation back under control.

The ERM

A year later, in October 1990, with inflation, which had in the meantime risen to over 10%, slowly coming under control, a renewed attempt was made to re-establish the anti-inflationary credibility of policy, by formally entering the ERM. An important non-monetary consideration at the time was that the United Kingdom would have little influence on the outcome of the European Inter Governmental Conference (the IGC), which was about to start, had we not then joined the ERM. The monetary question was essentially whether joining the ERM in the circumstances, and necessarily in practice at around the market exchange rate at the time, was a reasonable risk. While it is clear that countries have successfully, and with advantage, pegged their currencies to that of another country as an external policy discipline, there is inevitably a danger that the domestic policy needs in the partner countries will at some point diverge. A currency link can survive a degree of stress of this kind, but if the tension becomes severe, then either one party or the other must accept policies that are seriously inappropriate for its domestic condition or the link is likely to break. (It is of course to try to reduce the risks of this sort of tension emerging in the context of the irrevocable locking of parities involved in European Economic and Monetary Union that the famous convergence criteria were built into the Maastricht Treaty. One can debate whether they do in fact sufficiently reduce the risk of tensions emerging between the prospective member countries. But if even those criteria are not met, in substance not simply in form, and on a sustainable and not just a one-off basis, then monetary union could be a considerable adventure—and that of course is the stuff of the economic debate about EMU. But that is by the way in my present context.)

In fact at the time of our entry into the ERM our policy needs appeared to coincide with those of our partners. The economy was responding to the high though falling level of interest rates and inflation was coming down. In principle, it seemed possible that with the enhanced policy credibility that ERM membership was expected to bring, we could hope to complete the domestic economic stabilisation with

lower interest rates than otherwise, and so at less cost in terms of loss of output.

As you know that is not how things turned out. In the event reunification meant that Germany needed to maintain a tight monetary policy at a time when the domestic situation in a number of other ERM countries, including the United Kingdom, required an easing of monetary policy. The results of this unique and unforeseen divergence in the domestic policy needs of countries whose currencies were pegged together through the ERM are certainly familiar to you.

It can certainly be argued that the problems within the ERM—including our own problem—could have been avoided by timely adjustment of the relevant parities. And so in principle they could. But in practice it is never as easy as that makes it sound. By the time the developing tension became apparent, the Deutsche Mark anchor was already entrenched as the absolutely key element of the monetary policy framework in other member countries—on which their anti-inflationary credibility crucially depended. To give that up, without a real fight, would have imposed real economic costs. These costs might have been less if it had been possible to agree upon a unilateral Deutsche Mark revaluation—making it clear that the root of the problem lay in the exceptional circumstances of German reunification. But that approach could not be agreed.

We were then confronted with a situation in which raising interest rates made no economic sense in terms of our domestic conditions and so we sought to maintain the parity through intervention in the hope that the pressures in Germany would ease. In the event they didn't ease soon enough and after very heavy intervention, and a last ditch rise in interest rates, we had no choice but to withdraw from the ERM—on 16 September 1992, Black or White or even Grey Wednesday, depending on your point of view.

An explicit inflation target, 1992–date

There are certainly a lot of lessons that could be drawn from this somewhat cursory description of our experience with what were essentially all intermediate target policy frameworks. The conclusion I think that I have drawn is that there *is* no magic formula. Any intermediate target you might choose can let you down and may need to be over-ridden in setting policy in the light of all the other information available to you. But if you accept that, then you have the dilemma that over-riding an intermediate target is likely to have a damaging effect on monetary policy credibility. Perhaps it is *post hoc* rationalisation—because in practice we really had nowhere else to go once we'd been driven out of the ERM; but these considerations point to the adoption of an explicit target for the immediate objective of monetary policy itself—inflation; and they point to comprehensive analysis of *all* the information bearing on inflation—in effect a comprehensive inflation forecast—as the preferred technique. That of course is the framework we now use.

But before I describe it in more detail, I should perhaps just mention that our experience over the past decade or so was not unique. Most countries had comparable difficulties—and a number have drawn similar conclusions. Canada, for example, dropped her monetary aggregate target in 1982 and eventually introduced an explicit inflation target in 1991. And other countries that have gone down this route include New Zealand, Sweden, Spain and Finland—the last two now combining it with membership of the new, wide-margin, ERM. But even in the many more countries that have not gone down the route of inflation targeting, it's true I think to say that the expected future rate of inflation itself does nevertheless play a larger role in their policy formulation process than it did.

The inflation target itself

The inflation target was initially set shortly after our ERM exit, in October 1992 when the then Chancellor Norman Lamont wrote to the Treasury and Civil Service Committee announcing the new monetary framework, with the objective of keeping retail price inflation (measured precisely by RPIX ie excluding mortgage interest payments) within a band of 1%–4%, with the further objective of being in the lower part of that range (ie 1%–2½%) by the end of the present Parliament. The target was reset by Kenneth Clarke in his Mansion House speech in June of last year—as 2½% or less (on the RPIX measure) for the indefinite future.

Now for the specialist there are some interesting questions about this precise formulation of the objective—whether it would be better as a price *level* than as a rate of *change*, is RPIX the best measure, how close is it to price stability allowing for technical progress, and how close should it be and so on. The much more important thing at this stage, it seems to me, is that we should do what we say, and convince people that we will continue to do what we say.

The Inflation Report

In order to help to underpin our commitment to achieving the inflation target, the Chancellor at about the same time asked the Bank to produce and publish a quarterly '*Inflation Report*' giving the Bank's independent assessment of where inflation stood and where it was headed in relation to the target. Inevitably there was some initial cynicism about just how independent that assessment would in practice turn out to be. Well I can tell you it is *totally* independent. Neither the Chancellor nor his Treasury officials actually see the *Inflation Report* before it is printed for publication—although we do inform them some days in advance where we have finally decided to come out.

This is not simply a matter of amour propre. It is essential to the integrity of the process. It obliges the Bank to explain, and makes it accountable for its analysis. This means that the Bank's professional reputation is on the line as never before, and that, I have to tell you, concentrates the mind wonderfully well. And it provides outside commentators with the opportunity to debate that analysis,

which provides us with valuable additional insights into things we may have wrong. The essence of this part of the framework is its transparency. The *Inflation Report* would lose much of its value if it were subject to comment by Whitehall or Downing Street pre-publication. The corollary is that we should not be upset if they, or others, disagree with us post-publication.

A key feature of the *Inflation Report* is, of course, its forecast of inflation some two years ahead—which is a fundamental influence on the Bank’s policy advice, because of the long and variable time lags before monetary policy has its full effects. We have from the beginning been concerned to explain that such forecasts are not, and cannot be, a precise science producing point estimates for future inflation in which we are uniquely confident. We now illustrate the extent of our uncertainty by displaying the forecast as a probability distribution, a sort of open fan on its side—with the uncertainty typically increasing though not necessarily symmetrically, the further ahead you look. That’s not simply to reduce the chances of our being proved wrong! It is in fact telling it as it is, and trying to bring home to people that monetary policy is an uncertain business—whatever the policy framework.

I am sometimes asked whose forecast exactly is it? Is it the analysts’, or their managers’, or the Directors’ or the Governors’? The answer is that it is the Bank’s, with inputs at all those levels as well as points in between. In fact, we have a sequence of meetings at which we assess the ‘news’ since the last forecast (ie that’s to say those developments that are not as we had expected), then discuss the behavioural assumptions in the light of past relationships and the news in the current data, and we discuss the nature of the risks; then we review the results as reflected in an initial forecast, in light of which we may re-examine some of the assumptions or our assessment of the risks until we are all reasonably comfortable with the result. It is important, given the crucial role it plays in the process, that the forecast should be something that all those involved in its preparation should feel that they own. It is not just what spills out of a vast macroeconomic model—in fact we do not use a vast macroeconomic model although we do model particular aspects of the economy and use these in the forecasting process.

The meeting with the Chancellor

So much then for the *Inflation Report* and the quarterly medium-term forecast of inflation which it encompasses. Let me now turn to the third element of the present monetary policy framework, the (more or less) monthly meetings with the Chancellor.

This meeting is sometimes represented as a rather casual affair lasting no more than an hour at which we might almost toss a coin. The reality is not quite like that.

In fact, the monthly meeting comes at the end of a rather lengthy and rigorous process, structured in relation to our

receipt of the key monthly economic, monetary and financial data. This process begins, in the Bank at least, with the production of an internal ‘Monthly Economic and Financial Report’ which incorporates the latest information. That report is then discussed at a Monetary Review Committee, chaired by the Deputy Governor and attended by some fifty or so officials of the Bank ranging from analysts to directors and, importantly, including not only the economic specialists but also the financial market specialists, and now some of our regional agents. They assess the current situation against the background of what we would have expected to happen and analyse the ‘news’ to try to decide whether it points to a need for policy change. About a dozen of the more senior people at that meeting then attend a meeting of the Monetary Policy Committee which I chair myself and at which we discuss the analysis and agree upon the assessment that we send to the Treasury—in fact to Sir Terence Burns, the Treasury Permanent Secretary. The Treasury itself has meanwhile been going through similar preliminary procedures.

The more senior of the Bank team—about seven or eight in all, normally led by the Deputy Governor, then meet with their Treasury counterparts in the Burns Committee to establish the facts and discuss their respective assessments. The Bank team report the outcome of their discussion to me, and the Treasury report to the Chancellor. You will find the result of the Burns Committee’s review of the facts in the early part of the minutes of the meeting with the Chancellor that are subsequently published.

In the light of all these inputs from the Bank team I then prepare my own draft speaking note for the meeting with the Chancellor, setting out briefly our analysis and the advice that follows from it. The Monetary Policy Committee then reconvenes, usually early on the morning of the meeting with the Chancellor, to take account of the latest data and market information, and we agree the text of the speaking note. At the meeting with the Chancellor, which is attended on our side by the Deputy Governor and the two Monetary Stability Wing Directors, as well as myself, I then read out the speaking note and hand it to the Minutes Secretary so that it is recorded verbatim for publication. (I have reserved the right to make omissions, relating particularly to the exchange market situation or to the Budget, although in practice I cannot recall having done this other than to exclude very occasional confidential statistics.) This somewhat elaborate procedure is designed to ensure both that the advice that I give is the Bank’s advice and not simply the Governor’s, and that that advice is recorded accurately without any lengthy negotiation. The Chancellor—who will know the way the Bank is likely to be moving from the discussion in the Burns Committee then typically gives his own assessment, and after discussion around the table involving other Treasury Ministers and Bank and Treasury officials, the Chancellor takes his decision.

Since April 1994, the minutes for the meeting have been published two weeks after the following meeting. I hope

that next time you read them you will now appreciate the intensive labour—usually a labour of love—that leads up to them!

Although in principle the Bank may decide when to implement the Chancellor's decision—up to the next meeting, in practice we would nowadays expect to implement it on the next occasion on which we intervene in the money market (which may be later the same day, or, if the meeting is in the afternoon, the following morning) unless there were a wholly overwhelming reason for delay. For that timing to be possible, Treasury officials will have prepared a contingent draft of a press notice before the meeting if they think there is any likelihood of a change!

The Bank's advice is based partly on its medium-term forecast for inflation which I have described earlier and which itself includes an assessment of the probabilities of alternative possible outcomes. But our advice, which must necessarily crystallise into a precise recommendation, takes account too of subsequent data, and includes a judgment as to where on the spectrum of risks we should aim to be. Our accepted interpretation of the inflation target is that we should aim consistently for a position in which it is more likely than not that RPIX inflation will be at 2½% or below in two years' time. We stand to be judged by that advice, as the Chancellor stands to be judged on the basis of his decisions.

Assessing the present framework

How then, Mr Chairman, should we assess this—still relatively new—monetary policy framework?

I see it as having a number of advantages.

First, the focus on the immediate end objective of monetary policy—permanently low inflation—is unambiguous, and better publicly understood than the intermediate alternatives.

Second, it provides a sharper focus too, for our own analysis—which I think has improved as a result—but then you would expect me to say that. At the same time it allows us to make use of *all* the information about the economy that is available to us in relation to that objective rather than attaching particular weight to this or that intermediate target—which as we have seen can all too easily either lead us astray or, if we disregard its message, run us into damaging credibility problems.

Third, it provides a clearly forward-looking focus. That is enormously important in my view partly because we know that monetary policy operates with a considerable time lag, even if we don't know much about the precise nature of the lag; but it is important, too, because it ensures that we take account of what is happening to the real side of the economy, including what is happening in the short term, because of the influence that this can have on the inflation outlook further ahead. Because of the emphasis we give to sustaining activity growth into the medium and longer term,

it is sometimes suggested that we ignore these real short-term effects. I don't think that is true.

Fourth, they have the great merit of transparency, so that everybody can see not just what we are aiming to do, but the content of our analysis and how and why we give the advice or reach the decisions that we do.

And fifth, they ensure clear public accountability for that advice and those decisions, which, as I say has certainly served to sharpen up our act but which also acts as an additional check and balance to the Chancellor's discretion—something which he fully appreciated when he took the decision to publish the minutes of our meetings.

'That's all very well' I hear you say 'but will it work?'

It is of course early days.

But the results so far are encouraging. Inflation itself over the past four years, on the target measure, has averaged 2.7%. This compares with an average of nearly 10% in the 20 years before we adopted the inflation target in 1992, including one single year when inflation rose to nearly 25%. Activity has grown consistently—and reasonably steadily—for eighteen successive quarters—at an average annual rate of 2.6%. Unemployment has fallen almost month by month during this period, from a peak of over 10.5% to below 7.4% now. And the prospect for the next two years—the extent of most forecasting horizons—remains very encouraging, with most forecasters predicting continuing steady growth with low inflation.

And though it may be tempting fate to say so, we have not had a serious financial crisis during the whole of this time. Where in the past policy was too often made on the hoof, in Pavlovian reaction to pressures in the financial markets, it now seeks to anticipate events and is based upon a regular, systematic and structured discussion of the economic facts. We've also moved to a situation in which we can—meaningfully—adjust rates by small amounts. You cannot imagine what a difference all this has made.

I don't think this is simply coincidence. Certainly it is true that we started in 1992 with some degree of slack in the economy post-ERM; and it is also true that the inflationary climate worldwide has been better than for a very long time helped everywhere by increasing competition—nationally and globally—and by rapid technological advance, especially in information technology. But it has not all been plain sailing. We have, for example, had to contend with a sharp rise in world commodity prices last year as well as with weak economic activity in continental Europe. And more generally I would have to say that we have contrived to throw away strong hands before. So time alone will tell.

But I am very hopeful, Mr Chairman, and I feel a good deal more comfortable with the monetary framework that we have today than I have at most times in the past.

I should like to think that my successor will be able to come to deliver the Loughborough Lecture in ten years time and review a decade of growth through stability. If he—or she—can't do so, you will be able to judge for yourselves whether this was a result of our own technical incompetence or some

failure of the political process. In the former case I suspect you would see a lot of unfamiliar faces at the Bank. In the latter case you may just find that the Bank of England had been made independently accountable for decisions about monetary policy—but that is the subject for another lecture!

Prospects for monetary stability and the economics of EMU

*The **Governor** reviews⁽¹⁾ the recent performance of the British economy and argues that the encouraging record can be maintained, and even improved upon, providing a firm grip is kept on inflation, fiscal policy is prudent and sustainable, and supply-side policies promote flexibility and market competition, including an emphasis on free trade. The **Governor** welcomes the modest rise in interest rates in October, but notes that some further rise in rates may become necessary in due course. He comments that economic forecasters agree on an outlook combining continuing growth with low inflation over the next two years.*

*The **Governor** argues that Britain's interest lies unambiguously in a stable and prosperous Europe. He reviews the economic arguments for and against EMU, noting that the risks are greater if EMU starts from a position in which there is substantial divergence in the economic situations of the various member countries. Thus, it is vitally important for all to pursue macroeconomic discipline and structural flexibility. Finally, the **Governor** notes that Britain must be prepared for the proposed EMU starting date of 1 January 1999 whether or not EMU will happen, and whether or not Britain is in or out.*

Mr President, the British economy is now well into its fifth consecutive year—our nineteenth successive quarter—of expansion, at an annual average rate of 2.6%, and that expansion has been at an unusually steady pace. Unemployment has fallen, month by month, almost without exception, for most of that time, by almost a million, to a rate of below 7½% of the workforce. That is still wastefully high. But it is the lowest rate of any major country in Europe. Our external current account is in near balance, despite weak demand in our major trading partners in the EU. And—just in case you thought I hadn't noticed, or perhaps forgotten—retail price inflation (RPIX) has averaged 2¾% over the past 4 years, compared, unbelievably, with over 10% in the preceding 20 years.

But what you want to know is can we keep up—or even improve upon—this recent performance. My answer is a cautious yes—but it comes with conditions.

A first condition is that we keep a firm grip on inflation, in line with the Government's inflation target of 2½% or less for the indefinite future.

The point is that inflation is essentially a symptom of an emerging imbalance between demand and supply in the economy. We have learned that you cannot secure economic growth in anything other than the short term simply by pumping up demand without regard to the underlying capacity to meet it. So what we are really trying to do by aiming for permanent *price* stability is to achieve lasting *economic* stability in a much broader sense—a sustainable balance between demand and supply growth.

You have all seen the consequences when we have failed in the past, and the boom—however pleasant while it lasted—

had to be stopped in its tracks. That kind of experience has created uncertainty and scepticism about the seriousness of our ongoing commitment to stability even today. That uncertainty distorts economic decision-making and is immensely damaging to our long-run ability to generate wealth and thereby to meet our wider social goals. So it is not enough just to aim for 'reasonably low inflation' as is sometimes suggested by our critics, but which might come to mean anything. If we are to convince you and others outside that we really will provide a stable environment in which, for example, both industrial and commercial and financial businesses can reliably plan and invest for the longer term, without building a fat inflation risk premium into their calculations, then we have to do what we say we are going to do and actually deliver effective price stability as reflected in the inflation target.

We now have a monetary policy framework for doing this: an unambiguous objective—the inflation target; uniquely transparent analysis directly related to that objective, which is open to public scrutiny and comment; and public accountability for both the Bank of England's advice and for the Chancellor's decisions.

That still doesn't make the task easy.

We are currently seeing an almost textbook, domestically driven, economic upswing. It started with monetary acceleration through last year. It fed through into final domestic demand, particularly consumer demand, in the first half of this year. And it has come through more recently into domestic production, which had previously been held back by a stock overhang.

(1) At the Confederation of British Industry National Conference, Harrogate on Tuesday, 12 November 1996.

We take the view that, while there is still no doubt some degree of spare capacity in the economy, the accelerating upswing will need to moderate if it is not to put the inflation target at risk further ahead. That is why we welcomed the recent modest rise in interest rates. It may well be that some further rise will become necessary in due course—and that was the conclusion in our latest *Inflation Report*. But by acting promptly to begin gradually easing back, the Chancellor has helped to limit the extent of the rise that may ultimately become necessary, and improved the prospect of lasting expansion.

The position is complicated by the erratically sharp appreciation of sterling through the autumn, which probably has as much to do with developments abroad as in this country. It is suggested that this made the rise in interest rates unnecessary. The problem with this is that the stronger exchange rate does nothing directly to restrain the domestically driven upswing in demand. It may affect our net trade position—if indeed sterling persists at the recent level, which is uncertain—and we certainly recognise that concern; and it should help to dampen inflation at least in the short term. We take account of these influences, of course, in our inflation forecast and in our policy advice. But there cannot be any automatic offset against interest rates—certainly no simple rule of thumb. Nor can the exchange rate become an excuse for overriding the inflation target. We have been down this road before—in 1987 for example. The objective of monetary policy can then become unmanageably blurred.

So much then for a tight grip on inflation as a necessary condition for keeping up our recent, better, economic performance. On its own it is clearly not enough. There are two further critical conditions. It needs to be accompanied by prudent and sustainable fiscal policy. And it needs to be accompanied, too, by structural, supply-side, flexibility, including free trade and market competition. That does not, and of course cannot, deny a very important role for government regulation—even dare I say, EU regulation. What it means is that all such regulation needs to be kept under constant review and justified against the economic costs it may involve.

If these three conditions are satisfied, then the rate at which the supply capacity of the economy grows is determined essentially by your efforts—in co-operation with your employees. As it is I don't know of any serious forecaster who does not expect continuing growth with low inflation over at least the next two years.

Now all three of these conditions—stability-oriented monetary policy, fiscal prudence and sustainability and structural flexibility—apply in our national economic interest, whatever the outcome of the present merger talks relating to EU monetary policy and EU central banks. They are in fact today's received wisdom throughout the European Union.

Fundamentally of course EMU is a political matter which arouses strong passions on either side. But there is nothing obvious or self-evident about the economics—where the answer, as so often, is 'it all depends'. It depends essentially upon whether, in Monetary Union, the different member countries would find that the single monetary policy—the single interest rate—was, consistently, at least broadly compatible with their national economic situation.

If it worked well in this respect, then there would be real advantage, in terms of intra-regional exchange rate *certainty* in a single currency, as well as lower transactions costs. But if domestic policy needs were likely to diverge in a major way, so that the single policy was too expansionary in some countries but too deflationary in others, that could give rise to serious tensions, including possibly persistently higher unemployment in some areas and pressure for protection. In that case it would be better for *everyone* if we all continued to pursue stability-oriented macroeconomic policies and structural flexibility independently, outside Monetary Union. If we did, successfully—and it is, of course, a big 'if'—then that should deliver reasonable *de facto* exchange rate stability within the EU area over time, though not the certainty that only comes with the single currency.

So the economic issue is whether the benefit of intra-regional exchange rate certainty, as against 'reasonable' *de facto* stability is worth the risk of intra—and possibly extra—euro-area tensions. It is a difficult judgment and the people to steer clear of are those who claim at this stage to *know* the answer. I'm not at all surprised that CBI opinion appears divided. But it is reasonable to suppose that the risk is greater if we start from a position in which there is substantial divergence in the economic situation in the various member countries. It was precisely to try to reduce the risks that the famous 'convergence criteria' were built in to the Maastricht Treaty. They were intended to ensure that at least a minimum degree of genuine, sustainable, convergence has been achieved before Monetary Union goes ahead. I doubt whether the architects of the Treaty envisaged the present hectic dash for the line—the chosen calendar deadline; and I doubt whether they envisaged either that some of the runners might be tempted to take artificial stimulants in order to get there! The decision when the time comes will be for Europe's politicians. I can only hope that they weigh the economic risks seriously. If they disregard them, there can be no assurance that Monetary Union will lead to the political cohesion that they have in mind.

But, however that turns out, what is vitally important is that we all do—whether in or out—continue to pursue macroeconomic discipline and structural flexibility based on free trade and open markets—in our own national interests but also to preserve the collective benefits of the single market. In that case, there would be no cause—it seems to me, for the outcome on Monetary Union—whatever it is—to lead to antagonism or hostility.

In the meantime, Mr President, we in this country must be prepared for 1 January 1999 whatever the outcome. That means, in the first instance, that the wholesale financial markets of the City must be ready to transact business in euro whether as our own developing national currency or as a foreign currency alongside the dollar and yen. We at the Bank are working closely with them to ensure that they will be. That will enable the City to offer euro facilities to those international industrial and commercial businesses that need them from the start. Many other businesses, including retail-oriented businesses, have more time. They will not be much affected, even if the UK participates in Monetary Union, until euro notes and coin, become available in 2002, and personal banking facilities generally convert to the euro denomination. I recognise that many of you are concerned about what Monetary Union will mean for you. I therefore welcome the initiative taken by the CBI and the British Chambers of Commerce in conjunction with ourselves at the

Bank to arrange a series of workshops around the country to discuss the practical issues.

Mr President, let me sum up. This country's interest lies unambiguously in a stable and prosperous Europe. Fundamentally, that requires that all EU member states pursue policies directed to monetary stability, fiscal sustainability, and structural, supply-side, flexibility including free trade and market competition. And that remains true whether or not there is an early move to Monetary Union. In pursuing these same policies, the British economy is in better shape than it has been for years both to contribute to, and take advantage of the opportunities that will be presented by, that stable and prosperous Europe. And that remains true whether or not the United Kingdom is part of a Monetary Union. We do not need to be apprehensive about the euro in either case, but we do need to be prepared.

Financial regulation: why, how and by whom?

The Deputy Governor⁽¹⁾ considers three questions: why regulate financial institutions?; how should financial regulation be conducted?; and who should be responsible for doing the job? On the first, he explains that the Bank of England, as banking supervisor, views reducing the risk of individual bank failure as its essential supervisory task, but that—in view of banks’ economic function as risk-takers and also the need to avoid moral hazard—depositors must accept that the possibility of such failure cannot be entirely excluded. In examining the manner in which regulation should be conducted, the Deputy Governor reviews the familiar tools such as capital requirements, but also considers the insights on best practice learned from the Bank’s own review of supervision. Finally, he considers the case for reform of the regulatory structure in the United Kingdom. He argues that any structure should take account of the fact that banks remain a distinctive type of institution, and stresses that the priority is co-operation among regulators based on a clear understanding of responsibilities and the free flow of information.

I have given myself rather an ambitious title today. This reflects the fact that the Bank of England has recently conducted a review of banking supervision with the help of Arthur Andersen. We published their findings and our response to them in July. In the course of the Review we thought in some detail about how the practice of financial regulation—and specifically banking supervision—should react to the rapidly changing external environment. Financial groups are becoming more complex and more global. How should supervisors respond? If banks and securities houses merge, or an insurance company starts a bank, as the Prudential and others have done, what sense does it make to have a number of separate regulatory structures? Is that not less efficient, and more costly than one single, all singing all dancing mega regulator?

Others argue that in this new world, while a single regulator might not make sense, we should nonetheless cut the cake a different way, and distinguish clearly between prudential regulation, on the one hand, and conduct of business regulation on the other.

I would like to try to unravel this complex set of issues by considering three questions: why regulate financial institutions at all; how should financial regulation be conducted? and, finally, who should be responsible for doing the job?

Why regulate financial institutions?

At one level, the answer to this question is well rehearsed. Financial regulators collectively have four objectives: to protect the economy against systemic risk; to protect individual depositors, insurance policy holders and even, to some extent, investors against loss; to protect customers against business misconduct; and finally to protect society at large against crime, for example through ensuring that

financial firms have systems in place to detect and report laundered drug money or other proceeds of organised crime. I shall limit myself to considering the first two of these this evening, since they are the prime responsibilities of the Bank.

But, even then, we appear to have a daunting—not to say impossible—task. How can any regulators offer a blanket assurance to depositors and investors that their money is safe? The truth is that they cannot. And, after all, in financial as in other markets, there is a role for the principle of *caveat emptor*. So there is an important balance to be struck between the responsibilities of regulators on the one hand, and those of depositors, investors, insurance policy holders and their advisers on the other. And while we must always be conscious of the need to maintain confidence in the financial system, we are (and must be) in the business of offering a degree of, rather than complete protection for, the individual depositor.

The explanations for the limits to regulation are twofold: practical and theoretical. We must try to do both ‘what is possible’, and ‘what is right’. The practical limits (what is possible) relate to the tools available, and hence to how regulation is carried out—I will return to this later. The theoretical limits (what is right) relate to the rationale for regulation.

I said I would consider just the first two objectives of regulation—to protect the economy against systemic risk; and to offer a degree of protection against loss to individual depositors, investors and insurance policy holders. In this context, the Bank of England—as banking supervisor—views reducing the risk of individual bank failure as its essential supervisory task. However, it is quite clear to us that we are not required, and should not be required, to prevent all bank failures. To do so would require either a

(1) In the Sixth Anthony Howitt Lecture delivered on 2 December 1996 at the Chartered Institute of Management Accountants.

damagingly tight constraint on risk-taking by banks or essentially open-ended support from the public sector. Alan Greenspan, Chairman of the Federal Reserve in Washington, made a similar point in a speech in Stockholm in May this year, when he said: ‘we should not forget that the basic economic function of these regulated entities is to take risk. If we minimise risk-taking in order to reduce failure rates to zero, we will, by definition, have eliminated the purpose of the banking system’. The same view would be taken by securities regulators.

There is also a second, moral hazard, argument against watertight supervision. If the state guarantees the existence of individual banks, that can create incentives which encourage irresponsible behaviour. The prize for taking excess risk may—if things go well—be excess returns (and telephone number bonuses) while, if things turn out badly, the state steps in and picks up the tab. This is known as a one-way bet. It would prove as costly for the central bank—and ultimately the taxpayer—as Frankie Dettori’s seven winners were for the turf accountants.

The same moral hazard argument applies to deposit protection schemes. Compensation arrangements specifically allow for institutional failure—but with co-insurance. Only 90% of a bank deposit is insured, and there is a maximum payout per depositor of £18,000. Limits also apply in the case of investor compensation. So depositors are still encouraged to assess the riskiness of the institutions with which they deal. That therefore adds a degree of market discipline, which will probably be faster acting, and more effective, than the efforts of regulators.

But of course the Bank of England wears two hats. Having as supervisors tried to limit the risk of failure, when faced as central bankers with such failure, we must then consider whether or not to offer assistance. When making this decision, the overriding principle is that any action must be directed at safeguarding the financial system and therefore preventing damage to the wider economy. Beyond that, we apply five rules:

- first, we explore every option for a commercial solution before committing our own funds;
- second, we seek to avoid any subsidy to private shareholders;
- third, we aim to provide liquidity to solvent institutions rather than supporting an insolvent one;
- fourth, we look for a clear exit; and
- fifth, we usually try to keep the fact that we are providing support secret at the time, to avoid destabilising other firms.

And, as events over the last few years have suggested, all this means that we do not have a list of institutions which are eligible for last resort assistance. In the early 1990s, we

provided help to a number of small UK banks, where we believed market sentiment at the time was such that their failure could have widespread consequences for confidence. By contrast, in 1995 we took the view that the possible failure of Barings Bank did not have systemic implications.

We are quite clear, therefore, that depositors and investors must accept that failure is, from time to time, to be expected in financial markets, just as it is in the retail sector, or—sadly—among football clubs. But the public also has the right to expect supervisors and regulators to be active on their behalf. They expect eyebrows to be raised, whistles to be blown, and red cards to be waved aloft, from time to time. And they are right.

This brings me to my second question:

How should financial regulation be carried out?

As with question one, the answer lies in part in familiar territory. Focusing once again on the first two regulatory objectives, regulators set capital requirements to cover the more readily quantifiable risks; they produce rules on firms’ liquidity; they enforce limits on the scale of exposure to individual counterparties; they conduct consolidated supervision—considering the impact of the rest of the companies in a financial group on the health of the regulated entity; and they seek to ensure that firms have robust systems and controls.

Most fundamentally, perhaps, regulators can ask questions, and attempt to take advantage of all the information at their disposal to form a judgment of the risks facing depositors, investors, insurance policy holders etc, and of the quality of an institution’s management. In addition to enforcing rules and looking for problems, they can therefore help management. They can spread knowledge of best practice: asking firms about the full range of risks they face (including those—like reputational and settlement risk—that they would often rather ignore); pointing out to complex groups the extent to which their managerial and organisational systems have moved away from their legal structure; spotting signs of fraud or money laundering; and revealing gaps in management’s understanding of new financial instruments. Through speaking to a wide range of institutions, they notice differences in the way risks are viewed, managed and priced and can challenge managers to justify their particular perspectives. This then is the familiar answer to the question ‘how should financial regulation be carried out?’—although some may be surprised to hear me refer to the potential benefits to management.

The Bank’s Review of Banking Supervision

But putting it all into practice is not easy.

That is why we carried out a review of banking supervision this year to examine whether we were keeping up with best supervisory practice. Arthur Andersen talked to four other

UK financial services supervisors and regulators, and to nine overseas banking supervisory authorities, and put marks on benches on our behalf.

They found that regulators everywhere were asking themselves the same questions. In particular, they were all preoccupied by the question of how to set an appropriate balance between rules and judgments. Should supervisors simply set the rules, and shoot those who break them? Or does that create too rigid a framework, one which stifles initiative and imagination? There is no simple answer to that question. The Bank of England imposes an increasing number of rules; it has, for example, implemented regimes for capital adequacy introduced by the Basle Committee and by the EU. But our judgmental, flexible approach—what Arthur Andersen described as ‘the discretion given to supervisors to exercise informed judgment within approved guidelines’—still contrasts with that of many other regulators.

That contrast is, however, by no means as stark as once it was. The Arthur Andersen Review showed that the traditional caricatures of different regulators no longer reflect reality. In a fast moving marketplace characterised by rapid product innovation, other supervisors—who traditionally, as in the United States, operate a rulebook—are moving towards a regime that gives more scope for supervisory judgment. At the same time, the Bank has recognised the need to be more systematic in its risk assessment and has announced its intention to introduce a more formal approach based on a common ‘model’, known as the RATE model, to identify, using a series of qualitative and quantitative measures, the risks faced by the institution. So there is convergence between regulators—even without the discipline of Maastricht-imposed criteria!

The debate about rules and judgment is viewed by some to be synonymous with the debate about on versus off-site supervision. It is true that, in addition to being viewed as less rule-bound than other supervisors, the Bank is commonly viewed as doing relatively little on-site supervision.

Of course, this depends on how you define the term. Accountants are well aware that the Bank does, for example, make extensive use of reports prepared by auditors—who, of course operate on-site—in order to assess the adequacy of internal controls. In particular, the Bank regularly instructs banks to appoint reporting accountants to report on systems and controls and on the accuracy of prudential returns. And we talk to both internal and external auditors, and banks’ Audit Committees. But Arthur Andersen thought we should do more. In particular, they suggested that a more systematic approach to risk assessment should help supervisors to target reporting accountants’ work more precisely and to ask the most appropriate questions of auditors. We are looking now at just what this would mean in practice and will publish some proposals for change early in 1997. On which, of course, we will consult the profession.

The Bank’s supervisors also do a growing amount of work on-site. Since 1986, a team (including accountants seconded to the Bank) has carried out *ad hoc* focused on-site reviews, and in 1995 we introduced a Traded Markets Team to inspect the models institutions use to measure market risk. Following the Arthur Andersen Review, we have decided to increase the amount of time spent by supervisors on the premises—as this will enhance their knowledge of the business and enable them to meet and talk to a far wider range of the staff. There is no intention that this should amount to ‘inspection’ in the old-fashioned sense. We don’t want our supervisors to spend their lives putting ticks in boxes.

Indeed we are still very committed to a style of supervision which relies critically on the high quality both of our staff and of the supervisory tools that they have available to them. Arthur Andersen commented that, both domestically and internationally, the Bank’s supervisors have a reputation for their intellect, dedication and spirit of public service. But supervised institutions also said that the Bank’s staff lacked commercial awareness and detailed market knowledge. A comparison with the staffing profile of overseas supervisors also showed that our staff had less relevant experience outside the Bank or as supervisors than their major overseas counterparts.

In part, this reflects a debate about the role of specialism which the Bank has faced and which is common to many other organisations. As the skills needed to be a supervisor become more technical, so the need for ‘specialist career supervisors’ increases. On the other hand, career central bankers with experience in other parts of the Bank—for example, working in the markets or payments areas—bring valuable additional insight to supervision. One means of enhancing the stock of specialist skills is to ‘buy-in’ specialisms as and when they are needed. In a sense this is what the Bank does regularly with auditors, but what it has also done to some extent with the Traded Markets Team. However, the skills are often bought in in the hope that they will be transferred to existing staff. In common with other supervisors, we have found achieving such a transfer to be hard.

We are determined to solve this problem. We have therefore decided to increase the average length of time which our own staff spend in supervision before moving to other areas of the Bank. We have also decided to strengthen further the existing team of treasury and capital market specialists, and to ensure that our Review teams mentioned earlier are more closely integrated with the line supervisors that they advise.

Whether they are career supervisors or not, all staff require training. In common with other large organisations, the particular challenge is to create a culture of continuous learning and to ensure that training opportunities are available throughout an individual’s career. Arthur Andersen were entirely right to say that this was the key requirement. One important aspect is providing opportunities for outward secondment to banks, so that supervisors can experience a

commercial environment, and can—for example—learn about risk management in practice. We hope to boost our secondment programme substantially in the near future, and hope that we will receive support from the financial community in achieving that.

Trained, high calibre staff do, of course, need the tools to do the job. As supervisors one of our key comparative advantages—perhaps the most important one—is that we can make comparisons between institutions and analyse the trends in ‘peer groups’. We may not be able to pay ‘top dollar’ salaries in the marketplace, but we do have one advantage over the banks which can. Our people have access to and direct knowledge of the management approaches and risk measurement techniques of all institutions in the City. But of course this access, this information, is only valuable if we can make effective use of it. That is not a trivial challenge. We found in the course of the Review that we had spent relatively little on IT over the recent past when compared with other supervisors. Less than 5% of our total costs, versus up to 30% elsewhere. We have therefore announced a major new investment combined with the establishment of a special unit responsible for data administration and organisation.

All this amounts to a major programme of work to ensure that the Bank remains an effective banking supervisor, as long as we have that responsibility. Which brings me to my third question:

Who should conduct financial regulation?

In this case, it is fair to say that familiar or well-rehearsed answers are rather harder to come by. Few would argue over the nature of the problem: as financial groups have become more complex (incorporating a range of different financial businesses) and have begun to operate on a global basis, they have acquired a bewilderingly large number of regulators. In discussion with one large clearing bank here recently we established a list of over 150 different regulators, in the different jurisdictions in which they operated, before we gave up counting and went to bed.

It is hard to believe that represents the ideal regulatory framework. Even speaking as a regulator myself, I would have to accept that you can have too much of a good thing.

However, the search for a solution is proving problematic. The complex institutional structure of regulation reflects, at least in part, the fact that the financial services industry comprises a number of separate businesses (each needing to be regulated in a distinctive fashion), while many firms also conduct more than one type of business. As a result, the apparently simple solutions of one regulator for each type of firm or for each type of business do not provide a complete and tidy answer. In the first case, you run the risk that two firms carrying out identical business are regulated differently. In the second case, no one regulator has responsibility for setting capital charges for the firm as a whole.

But this is not a knockdown argument against any change in the regulatory structure in the United Kingdom. What of the argument I referred to at the start, that it would nonetheless be an improvement to cut the regulatory cake a different way? That the business of banks and securities firms has become sufficiently intertwined and indistinguishable that one regulator of both banks and securities houses would make better sense?

I must say that we are not persuaded. Certainly there has been a degree of convergence between banks and securities firms. Banks now own what we used to call jobbers and stockbrokers. Securities firms own banks, though generally relatively small ones (and of course not within the United States). But, in our view, there is still a reasonably clear distinction to be made between banks and other financial institutions, and their prudential soundness, or lack of it, can have rather different implications for the rest of the market.

Most particularly, in order to perform their economic function, banks engage in a high degree of maturity transformation: that is one of their prime economic justifications. They turn short-term deposits into long-term loans. So that a comparison of the balance sheets of major British, or American commercial banks, with those of the major securities firms, shows a very clear difference in their asset and liability structure. There is a much greater mismatch of maturity on a bank’s balance sheet, than there is on that of a securities house.

Furthermore, banks—unlike securities houses—are at the heart of the payments system. Their failure can therefore have a very direct and profound impact on the wider economy.

We continue to take the view that banks are a unique type of financial institution. That is not to say that market evolution may not mean that, in due course, the case for merging banking and securities regulators became stronger. But that is not where we are and indeed I note that the Labour Party are not making proposals to that effect in their own thoughts on the structure of regulation. Nor did the Treasury Select Committee in their most recent report.

Of course it may be argued that the distinctive characteristics of banks, and their potential to create systemic risk—which central banks can counteract—does not necessarily mean that the central bank should act as their regulator. I agree. But there are significant synergies to be had from maintaining an institutional link between the two functions, and the burden of proof rests, I think, with those who wish to make the case for disturbing that relationship.

There have also been arguments for change in the Financial Services Act area where currently the Securities and Investments Board is responsible for the integrity of markets, and for setting the framework within which the frontline regulators operate. Here the Labour Party have proposed that the SIB should absorb the existing

self-regulatory authorities, the PIA, IMRO and the SFA. This is not directly my business even though I am now a member of the Securities and Investments Board. The Board itself has taken the view that legislative change is a matter for Parliament, and that it will operate within whatever regulatory framework is laid down. But it may well be that, in some areas, consolidation would make co-operation easier to achieve.

There is another proposal involving radical change to the United Kingdom's regulatory structure which has received some attention recently known now as 'Peak Practice'. (It started life as 'Twin Peaks'.) This involves the creation of two 'Commissions' each reporting directly to the Treasury. The first (called a Financial Stability Commission) would focus on systemic risk and would be responsible for the prudential supervision of banks, building societies, securities houses, institutional fund managers and insurance companies, and also for the conduct of wholesale business. The second (called a Consumer Protection Commission) would focus on conduct of business and would be responsible for fair dealing between financial institutions and retail clients, and for the detection and prosecution of insider dealing and of market manipulation. It would also look after the prudential supervision of private client fund managers, financial advisers and small stockbrokers.

The argumentation behind the proposal is considered and thoughtful. But we are not convinced that the substantial upheaval and cost involved would be warranted. The model assumes both that a very wide range of firms are systemic and that all systemically significant firms should be regulated by the same institution. By contrast, we believe that banks remain unique in this respect (at least for the time being) and, were a single institution to conduct prudential supervision for everything from banks to insurance companies, it would still need to tailor the rules to meet the characteristics of particular types of business. In effect the new regulator could quickly become a collection of separate 'Divisions'. There is also an apparent gap, as the regulation of markets themselves does not fit into either Commission. So we are already up to three peaks. Meanwhile the costs of change would be substantial. The new commissions would not evolve easily out of any existing regulator. All financial firms would have a new regulator (two in most cases). They are unlikely to welcome that. And the synergies I alluded to earlier between the supervisory and lender of last resort activities of the Bank would be lost.

All these changes would require legislation. And, for the time being, no legislative proposals are on offer. So while it is always entertaining to debate structural change, and it may be that in due course structural change is what we have, it would be a shame if the debate diverted us from what we need to do. Our own efforts now are focused in two directions. These are to ensure, first, that, given the regulatory structure, costs are minimised, and, second, that co-operation between regulators is based on a clear understanding of responsibilities and the free flow of information.

Work on improving regulatory co-operation—at both a domestic and an international level—is currently intense. There is, as you would hope, already extensive contact between the Bank of England and the securities and insurance regulators in the United Kingdom. In particular, each financial group in the United Kingdom has a lead regulator and, where it contains a bank, this is usually the Bank of England. They convene regular college meetings to share information with the other UK regulators. At a different level, these links have recently been strengthened through cross membership between the Board of Banking Supervision (BoBS) and the SIB. As I mentioned, I am now on the SIB Board while Sir Andrew Large has joined BoBS. So, we have shown that there is no absolute requirement for legislation, if your aim is to improve information sharing.

At international level, attention has recently focused on the supervision of diversified financial groups. Indeed it was a topic addressed directly by heads of government at the Lyon summit in June. Subsequently, the Basle committee and IOSCO announced a joint initiative to strengthen co-operation between securities and banking regulators. The work will support that of the already established Joint Forum of banking, securities and insurance supervisors which has been set up to pursue practical means to facilitate information exchange, in addition to exploring other policy issues associated with the supervision of international financial conglomerates. And we have also been actively involved, along with the Americans, in some 'live' supervision work, looking at particular institutions and their practical problems. There are eight different regulators involved, three on this side of the Atlantic, five on that, so the meetings are naturally called quadrilaterals. Indeed most recently we have made life even more complicated by extending the work, under the auspices of the Joint Forum, to include other countries.

At the same time, supervisors of the world's leading futures exchanges have put in place a programme of work to strengthen the arrangements for supervising such markets and recently published an up-date of the work that was started at Windsor last year.

I would not wish to pretend that all this work, which generates information-sharing agreements and memoranda of understanding in an incontinent manner, will solve all problems of regulatory co-ordination. But I think that we are at least trying to move as fast as the marketplace, difficult though that challenge is.

And the marketplace is where I should end. It is time to stop. But it also the right place. Because we always need to remind ourselves that financial regulation is not a wealth-creating activity which has its own internal justification for existing. Its purpose is essentially to facilitate economic activity in the private sector, and to promote wealth creation by providing a framework of rules within which economic actors can operate confidently. In our view that means, as far as possible, a light touch. It

argues for an approach based on the principle that market participants can do what they want unless we say that they can't, rather than that they can only do what we say they can. That inevitably means that every time there is some kind of failure in the market, people reassess the rules and—most commonly—argue that they require further tightening.

Sometimes that is justified, but just as often it is not. I have tried today to explain how we have sought to draw the lessons from the Barings collapse, to strengthen regulation where needed, but without imposing further unjustifiable burdens. You will all have your own views as to whether we have set the dials correctly.

Are banks still special?

The Governor of the Bank, Eddie George, considers⁽¹⁾ whether banks continue to have a distinctive identity. He argues that beyond institutional identity lies the important question of whether banks continue to justify central banks' special concern for the stability of the banking system as reflected in both macro and microprudential oversight and in their role as lender of last resort. The Governor reviews changes in the make-up of banks' balance sheets, and contrasts these with the structure and functions of other financial institutions. He notes that, while in some respects banks may be less special than they were, they remain special in several important respects. He concludes that he would be very cautious about extending last resort liquidity provision to financial institutions not engaged in banking activity, particularly where banks' distinctive functions and the distinctive characteristics of banks' balance sheets did not clearly apply. While he does not think that such intervention can, realistically, be excluded altogether, he is concerned that an unduly liberal interpretation of systemic risk would increase the scope for moral hazard and ultimately weaken the safety and soundness of the financial system as a whole.

Mr Chairman, I am delighted to take part in this well-directed and well-timed seminar. I am particularly pleased to be able to share with you my thoughts on the question you put to me 'Are banks still special?' That question is partly a matter of institutional fact; but beyond that lies the question of whether the institutional characteristics of banks still justify central banks' special concern for the stability of the banking system reflected in both macro and microprudential oversight and in their role as lender of last resort. So the answers to those questions could have far-reaching implications for the role of central banks themselves.

In offering my answers I will ask, first, why banks have been regarded as special? Then I will ask whether banks have changed, or whether other financial institutions have become more bank-like? I will save my conclusions until the end! I am conscious, in this international forum, that I speak from a British perspective—in terms of the institutional and legal contexts and their evolution in relation to banks. But I would hope that, while some of the detail may be specific to the United Kingdom, the broad substance will not be.

In what ways have banks been regarded as special?

Let me begin then by discussing why, and in what senses, banks have been regarded as special.

The term 'bank', historically and more than ever today, covers a multitude of sins. In practice it refers to a range of

very different institutions which may, and do, within legal restraints, engage in a variety of different financial—and even some non-financial—activities whether on their own account or in an agency or advisory capacity. But banks have some key distinguishing characteristics in common. In particular they take unsecured deposits from the public at large.⁽²⁾

The particular characteristics of bank deposits are that they are capital certain and (more or less) immediately accessible to the depositor, so that they have come to be used as the principal means of making payments. In short, because of their convenience, bank deposits became the predominant repository for the immediately liquid asset holdings of the rest of the economy, and the predominant form of 'money'.

The attraction of these deposit and payments services depends upon depositors generally having a high degree of confidence that their funds will in fact be available on demand and it depends upon the cost of the services. In providing the services, therefore, the banks need to strike a balance between deploying their deposits in low-yielding, high quality, liquid assets to meet cash withdrawals, and riskier investments to generate a higher return. In this latter context banks have traditionally played a key role in financing the corporate and household sectors, earning their return by gathering information about, and assessing and monitoring, the creditworthiness of private sector borrowers, especially those who do not or cannot cost effectively provide the comprehensive, public, information that would allow them to access the capital markets. Much of the banks' lending, while nominally at short term, for example,

(1) In a speech given at the IMF Seventh Central Banking Seminar, Washington DC on Wednesday 29 January 1997.

(2) In the United Kingdom a bank is nowadays legally defined as an institution authorised by the Bank of England under the Banking Act to take deposits. This definition excludes a large group of specialist, mutual, institutions, the building societies, whose essential business is deposit-taking for lending for house purchase, and which are authorised by the Building Societies Commission under separate legislation. But this is an institutional detail, and it is notable that as they have extended into the money transmission business and diversified their lending activity. Furthermore, many of these institutions have elected to convert themselves into fully fledged banks.

in the form of callable overdrafts, is in practice illiquid and non-marketable. So a further distinctive characteristic of banks is that they typically function with a mismatch between their highly liquid liabilities and their less liquid, non-marketable, assets.

There is no need, I think, to labour the importance to the economy as a whole of these distinctive banking functions, or the damage that would be caused if the banks' role—as the repository of liquidity, as the core payments mechanism, and as the principal source of finance to at least a large part of the economy—were seriously interrupted. That in itself helps to explain the public interest in the effective functioning of the banking system, or why banks collectively have been regarded as 'special'.

But beyond that, the distinctive banking characteristics that I have described, of liquid liabilities and less liquid assets, give rise to special needs.

Given the banks' role in the payments system they may need late access to liquidity to square their positions *vis-à-vis* each other after executing payments instructions on behalf of their customers. This explains why, in their routine monetary operations to relieve shortages in the money market, central banks in many countries tend to confine their (late) lending to banks even when they accept a wider range of counterparties in providing liquidity through open market operations.

The same distinctive characteristics make banks especially dependent upon public confidence. Bank depositors are not generally in a position to monitor or assess the financial condition of their bank, so that any suggestion that a particular bank may not be in a position to meet its liabilities is likely to lead to the panic withdrawal of its deposits. This can precipitate the suspension of payments as a result of lack of liquidity even when a bank is solvent as a going concern; and the forced realisation of illiquid assets may in itself result in insolvency. Moreover, any suggestion that one bank is in trouble may be taken—perhaps wholly unjustifiably—as evidence that other banks are likely to be facing similar problems, especially when they are engaged in similar activities. Bank runs can for this reason become contagious. And the risk of contagion is increased by interbank exposures, including those arising from the banks' role in the payments system. So the 'special' nature of banks has reflected not just their distinctive functions, and the importance of those functions to the wider economy, but also their peculiar vulnerability to liquidity pressures. Central banks evolved in response to this vulnerability, which gave rise to a readiness to act as lender of last resort to the banking system in situations in which substantial systemic disturbance could otherwise occur and to an on-going concern for the macroprudential characteristics of the banking system. And while this concern relates to the banking system as a whole, last resort assistance, when it is judged to be necessary, is extended to individual banks because problems of course arise in the first instance at the level of the individual bank.

Now, the fact that central banks (in conjunction as necessary with governments) are prepared, in certain circumstances, to extend support in this way encourages bank intermediation; it represents in effect a form of subsidy, implicitly justified as being in the wider interest of the economy. It helps to preserve public confidence; and it enables the banks to take on more maturity transformation or risk than they could otherwise, so lowering the effective cost of their intermediation. But it has long been recognised that if central bank support is made available too liberally—in situations where there is no genuine systemic risk, so that it comes to be relied upon as a matter of course, then that would give rise to 'moral hazard'. The extent of bank intermediation would be unjustifiably expanded. On the one hand, the banks themselves may be encouraged to take on excessive risks; while, on the other, depositors may be encouraged to ignore risk and to become literally care-less as to where they place their deposits. So, both the safety and soundness of the banking system, and its competitive efficiency, and that of the financial system more generally, may be undermined.

Central banks' macroprudential concerns for the stability of the banking system have necessarily meant that they have taken a close interest in the risk characteristics of individual banks as the component parts of the system. But more recently (at least in the United Kingdom—with the coming into force of the first Banking Act in 1979) individual banks were brought under formal banking supervision for the first time, and non-bank depositors provided with limited deposit insurance. Such microprudential supervision of each individual bank, of course, also helps to reduce the risk of instability in the system as a whole, and even limited deposit protection may reduce the risk of bank runs, at least in the form of the sudden withdrawal of retail deposits. This, too, of course, can give rise to moral hazard problems if it is perceived as tantamount to a guarantee. But microprudential supervision and deposit insurance were introduced in the United Kingdom at least (though not in the United States) with the distinct, social, purpose of providing individual, small, depositors with a degree of protection against the sudden loss of their principal liquid asset holdings. This made banks, and bank deposits, special in a different sense insofar as similar formal supervision and asset protection were not (at that time) extended to other financial intermediaries or their liabilities.

These then are the respects in which banks have hitherto been regarded as special. Let me now move on to consider whether, or to what extent, the banks have kept their distinctive characteristics, or to what extent other financial institutions have developed similar characteristics so that banks are no longer special in that sense.

To what extent have banks changed?

It is certainly true, as I noted earlier, that banks engage in a range of financial activities besides those which I have described as distinctively 'banking' activities. Major banks everywhere have increasingly diversified the products and

services they offer, built up investment banking businesses and trading activities, extended into life insurance, and so on, sometimes on a single balance sheet or sometimes in separate non-banking entities. In the present context, however, the question is whether these developments have fundamentally altered the characteristics of the 'banking' part of their balance sheets. It seems to me that the answer, generally speaking, is that they have not.

On the liabilities side, while there may have been (indeed in some countries, where close substitutes for money, such as money-market mutual funds have taken off, there certainly has been) some erosion of the banks' market share as a repository for liquid asset holdings, that erosion has generally been very gradual. In the United Kingdom, for example, bank (and building society) deposits still account for 42% of personal sector liquid asset holdings against 50% a decade ago; the proportion would be very much higher if liquid assets included only those that are capital certain. And the vast bulk of the banks' liabilities remain in the form of unsecured, short-term, deposits. Despite the rapid development of (secured) repo markets, only some 3% of the major UK banks' funding (in sterling and foreign currency together) was secured (from information provided last autumn) through repo; and the figure for all UK banks, including the business conducted in branches and subsidiaries of overseas banks, which have less direct access to deposits, was only around 8½%. The proportion of secured funding is below 5% for other major internationally active banks that we have looked at, with the exception of JP Morgan and Bankers Trust—both somewhat special cases—where the proportion is very much higher (25%–35%). And even in those special cases it is still well below that for the major US securities firms (typically 55%–80%).

Banks remain, too, at the heart of payments systems. Payments may be made directly across bank accounts through instructions, for example, in the form of cheque or debit card; or they may be made indirectly, through, for example, the use of credit cards, the balances on which are subsequently settled using a bank account. Even where disintermediation creates new chequing facilities, as for example, in the case of money-market mutuals, these are still cleared through settlement banks. It is true that new forms of money transmission—e-money—are being developed, sometimes outside the conventional banking system. But I suspect that they, too, will typically depend upon clearing through the banking system. To the extent that they come to involve the creation of what are effectively direct deposits, they will represent 'banking' in a different form and become special, and logically subject to regulation, in much the same way as conventional bank deposits. In the payments system context, too, important progress is being made to reduce interbank exposures

(through the introduction of real time gross settlements systems in many countries, for example, and through the netting of foreign exchange settlements) but those exposures, as well as interbank exposures incurred in direct interbank transactions—the large bulk of all of which are unsecured—remain extraordinarily large. Individual interbank limits can substantially exceed 25% of capital (the normal supervisory limit for large exposures), and as an example of aggregate interbank exposures the major UK retail banks currently place some £115 billion, or 16% of their total assets, with each other or with other UK banks.

Turning to the assets side, there is some evidence of a gradual erosion of the role of banks in financial intermediation. One measure in the United Kingdom is a decline in the banks' (and building societies') share in the assets of the whole financial sector (including securities firms, collective investment vehicles, and life assurance and pension funds' investments etc) which has fallen fairly steadily over the past ten years, from close to 70% to some 55%. I believe that in the United States, where financial innovation has probably been even greater, comparable figures also show this decline, from around 45% in the mid-1970s to about one third now.⁽¹⁾

In the United Kingdom, bank lending to the corporate sector has fallen, erratically, from some 27% of total corporate borrowing outstanding (including all forms of debt as well as equity issuance) in 1985 to less than 17%. This mainly reflects the increased access of larger corporate borrowers to the domestic and international capital markets for short and longer-term corporate paper, where they often have a better credit rating than banks. Smaller corporates, on the other hand, remain very heavily dependent upon bank finance—for well over half their overall needs. Meanwhile the banks' share of net external finance of the personal sector has not changed much at all over the past decade, at around 80%.

Trends in the liquidity of bank assets are difficult to assess because liquidity itself is so hard to judge simply from balance sheet categories. The advent of securitisation and the direct sale of loans ought to have helped.⁽²⁾ But except in the United States, securitisation has in fact so far made only limited progress, and debt sales have been focused mainly on impaired developing country or corporate debt. One reason why prime corporate loans are not so far traded is the importance that both banks and borrowers still attach to their mutual relationships. My guess is that the liquidity of bank assets by these means will gradually increase; and that process may be helped by the development of techniques such as credit derivatives. But for the time being—and indeed some time to come—bank loans are, for the most part, likely to remain illiquid in most countries.

(1) J H Boyd and Mark Gertler ('Are banks dead? Or, are the reports greatly exaggerated?'. Federal Reserve Bank of Chicago, 30th Annual Conference on Bank Structure and Competition, May 1994) suggest however that the banks' share has in fact been stable if you adjust for off balance sheet activity and for the activities of foreign banks.

(2) Boyd and Gertler—*op cit*—estimate US bank holding company loans securitised or sold down in 1993 at \$135 billion; other estimates ('Remarks by the Vice Chairman of the Board of Governors of the US Federal Reserve System, Alice M Rivlin', at The Brookings Institute National Issues Forum in Washington DC, on 19 December 1996) suggest that now it may be of the order of \$200 billion or more. These figures compare with loans and advances remaining on the banks' balance sheets of some \$214–212 trillion.

We can nevertheless look at the crude balance sheet data, and, for what they are worth, we have looked at the share of loans to non-banks in total assets as a measure of the liquidity of the asset portfolio for a range of different types of institution. These data show that:

- for some representative small, domestic, UK banks the loan ratio is still some 70%–80% of the total, apparently with no particular trend;
- for large, internationally active, UK banks the share of loans is currently around 50%, having fallen quite sharply from some 65%–70% some five years ago, perhaps reflecting the expansion of their investment banking activity; and
- for large continental banks the share of loans is either side of 50%, having fallen more gradually.

Again JP Morgan and Bankers Trust are outliers. Their loan ratio to total assets is down to around 12% from around 50% in 1985 and 30% only five years ago. That is still much higher than the illiquid asset ratio for the large US securities firms which has fairly consistently been around 2%.

The conclusion that I draw from all of this is that while there certainly have been important changes affecting the banks, and the environment in which they operate, they have not yet, at least, been such as to affect fundamentally their relevant key functions or the importance of those functions to the economy; nor have they altered fundamentally the distinctive characteristics of either the banks' liabilities or their assets.

To what extent have other financial institutions become more like banks?

So, then, to what extent have other financial institutions developed similar characteristics to the distinctive characteristics of the banks as I have described them?

The question, let me be quite clear, is not whether other financial institutions perform economically or socially important functions—clearly they do—and those functions may equally be 'special' in their own distinctive ways.

It is also obviously true that, with the upsurge in financial innovation and globalisation that we have seen in the past 10–20 years, there has been substantial blurring of the boundaries between different types of financial institution and the increasing emergence of multifunctional, multinational, financial groups, so that non-bank institutions have taken over banks or offered banking services just as banks have entered substantially into non-'banking' financial activities. But that is not the issue either. The question is whether the distinction between banking and non-banking financial functions has been eroded—whether those functions are carried out in separate entities or on the same balance sheet. I do not think it has.

Take, for example, long-term savings institutions—life insurance companies and pension funds. They clearly perform a vital economic and social function, and they are subject to separate functional regulation because of their 'special' importance as homes for the long-term savings of the personal sector and as providers of long-term capital. But their liabilities are totally unlike the very liquid liabilities of banks, and the liquidity of their assets and liabilities are much more closely matched—indeed their marketable assets tend to be more liquid than their liabilities. The distinction remains even where these activities are carried out in a banking group, though in this case the different businesses have to be conducted on ring-fenced balance sheets and subject to different prudential tests, reflecting the quite different nature of the contracts and the different risks involved. That is not to deny that there may well be risks running from one part of the group to another—for example reputational risks or operational risks arising from shared systems or personnel and so on. It is not to deny either that there can be large cross-functional financial exposures. That, of course, is why the respective supervisors need to take an interest in all parts of a financial group and in intra-group exposures. But none of this, it seems to me, means that long-term savings institutions have taken on the distinctive special characteristics of banks.

So far, I would hope, so good in the sense that perhaps most of you would agree that this particular distinction remains. But have I chosen this extreme example as an Aunt Sally?

Well perhaps to a degree I have. So let me take some less obvious cases.

What about money-market mutual funds, for example? Surely they at least have some of the characteristics of banks? They, too, act as a repository for liquidity and it is possible to make payments from some of them, which looks very like a banking arrangement? And so it does. But in fact I think this appearance is deceptive, for three reasons:

- first, investments in money-market mutuals are not, as I understand it, in principle capital certain (though in practice they may be supported by the fund's sponsor); nor are they covered by deposit insurance (though this may not always be understood by the investor);
- second, as I mentioned earlier, money-market mutuals are not themselves at the heart of the payments mechanism, but in effect piggy-back on the banks which are;
- and, third, money-market mutuals do not undertake maturity transformation by making illiquid loans; like all collective investment schemes they put their investors' funds into marketable instruments in accordance with the rules of the fund.

Whereas money-market mutuals have something of the character of banks on the liabilities side of their balance

sheets, but not on the assets side, the converse is true of non-bank finance companies. They do make illiquid loans, much as banks do. But they typically fund themselves in capital markets or from the banking system, and do not offer capital-certain, immediately available, liabilities to the public at large which are in any way comparable to bank deposits. Nor do they typically offer payments services.

But what about the free-standing securities houses—and in particular those of American and Japanese parentage that have, up to now, been separated from commercial banking activity by the Glass-Steagall Act and by Article 65? They, surely, have both liquid liabilities and engage in maturity transformation; and, of course, they do actually operate partly through banking entities outside their home jurisdictions.

Again, however, I think appearances may deceive. The liabilities of the houses are not in fact a bit like bank deposits. While it is true that the houses have increased the extent of their unsecured funding, for example through public issues, the bulk of their liquid liabilities are still secured—with, as I said, some 55%–80% of the total funding of the US houses we have looked at typically in the form of repos. Nor do the houses hold themselves out to take deposits from the public at large. Nor, finally, are their liabilities directly usable as a payments medium. In all these respects the houses' liabilities are non-monetary—even if they can rapidly be turned into money.

On the assets side of the balance sheet, the securities houses continue to invest primarily in liquid, marketable assets which can readily be sold. This is partly a reflection of the nature of investment banking business, in particular trading, underwriting and so on, and of regulatory requirements, but also of funding uncertainty: the securities house protects itself by being able, if necessary, to contract the size of its balance sheet very rapidly. Illiquid assets continue to be a small proportion of the total, generally of the order of 2%, and the houses mitigate the maturity transformation risk in holding these, and marketable assets of more doubtful liquidity (such as some emerging market instruments), by matching with long-term borrowings.

What is certainly true is that the securities houses have expanded their activities enormously—with balance sheets extending to \$100–200 billion, which puts them in this respect on a par with large international banks. And, given their focus on trading activity—in money, capital and foreign exchange markets—they are, of course, huge counterparties of the banks, with very large exposures both among themselves and between them and the banks, but with the important distinction that exposures between, or to, securities houses are more typically secured.

Size in any event does not in itself mean that the securities houses now have the special, distinguishing, characteristics of banks—any more than the long-term savings institutions or the money funds or indeed large non-financial corporates, which may also have huge balance sheets and which may

also have large Treasury operations in-house to manage the funds for own account.

Systemic risk

So it seems to me that banks are indeed still special insofar as they continue to perform distinctive economic functions and insofar as their liabilities and assets still have distinctive characteristics. This means that there is still a distinct public interest in the activities of institutions that are engaged in banking—as defined—whether as free-standing entities or within a broader group structure. That interest includes a microprudential concern to provide some measure at least of protection to public depositors, reflected in the supervision of individual banking institutions and in deposit protection schemes. But it includes also a macroprudential concern with the stability of the banking system as a whole, because of its peculiar vulnerability to contagious—systemic—disturbance, reflected in central banks' preparedness to provide liquidity to the system where that is judged to be necessary.

Other forms of financial activity also perform distinctive functions, and have distinctive characteristics which make them special in their own different ways. And these special features equally may—and often do—give rise to special public interests. The public interest in these other financial activities may be driven by a social concern to protect consumers (for example the prospective beneficiaries of pension funds or life insurance policy holders, or investors, whether in collective funds or individually, through different kinds of intermediary, in capital markets), which is similar to the social concern relating to depositor protection. And it may extend to other aspects of the particular activity, including aspects of business conduct as well as the financial integrity of the institutions involved. In fact the public interest in non-banking financial activity has certainly increased in this sense—both in terms of the range of activities covered and the standards of protection demanded—as is reflected in the spread of financial regulation over the past 10–20 years as the activities themselves have expanded. Our own Financial Services Act, for example, which provides for formal regulation of investment business dates only from 1986. A corollary of this broadening public interest is that multifunctional financial services providers are bound to be subject to a broadening range of functional regulation—however such regulation is structured.

What I think is less clear is the extent and nature of the public macroprudential interest in non-banking financial activities. I have argued that other, non-banking, financial activities are not—because of the different characteristics of the related liabilities and assets—subject to runs in the same way as banks, and that they are not therefore subject to contagious—systemic—disturbance in the same sense as banks. But that does not mean that non-bank financial institutions cannot face liquidity pressures. It does not mean either that the failure of a non-bank financial institution could not—through its direct credit or settlements exposures

to other financial institutions (bank or non-bank)—have damaging knock-on effects. Conceivably, too, such a failure could have such serious consequences for the liquidity of—or price level in—some particular sector of the financial markets, that concerns would arise for the liquidity, or solvency, of other bank or non-bank institutions that were known, or believed, to be heavily exposed to that market. In this sense size does matter—and, whether or not one chooses to describe the risk of this happening as systemic, there is no doubt that a sufficiently large disturbance originating in the non-banking activity of one financial institution could put others in difficulty. This possibility must be of concern to financial regulators, including central banks, concerned with the stability of the financial system as a whole. It certainly, in my view, provides macroprudential justification for regulatory oversight of the activity of (large) non-bank financial institutions, and of the non-banking activities of banks—quite apart from microprudential regulation in the interests of consumer protection. It provides justification, too, for some form of consolidated prudential oversight of multifunctional financial groups and for monitoring large exposures, both intra-group and to outside counterparties. Where a problem of this sort does arise, it may well justify technical central bank intervention to help contain it—for example by facilitating payments and settlements to minimise market disturbance. But, I would be very cautious about extending last resort liquidity provision to financial institutions not engaged in ‘banking’ activity, and where the particular justification for it, based upon banks’ distinctive functions and the distinctive characteristics of banks’ balance sheets, did not clearly apply. While I do not think such intervention can, realistically, be excluded altogether, I am concerned that an unduly liberal interpretation of systemic risk would

increase the scope for moral hazard and ultimately weaken the safety and soundness of the financial system as a whole.

Conclusion

Mr Chairman, my answer to your question ‘Are banks still special?’ is essentially that while in some respects they may be less special than they were, they remain special nonetheless. They remain special in terms of the particular functions they perform—as the repository of the economy’s immediately available liquidity, as the core payments mechanism, and as the principal source of non-market finance to a large part of the economy. And they remain special in terms of the particular characteristics of their balance sheets, which are necessary to perform those functions—including the mismatch between their assets and liabilities which makes banks peculiarly vulnerable to systemic risk in the traditional sense of that term. Perhaps the day will come—and I do not at all exclude the possibility that other financial activity will continue increasingly to be carried on alongside banking activity, even on the same balance sheet, indeed I expect that to happen. That, in my view, does not reduce the special public interest in banking activity; although it may well affect the appropriate substance of banking supervision; and it certainly extends to banks’ other, different, functional public interests, including different regulatory interests. On the other hand I am not persuaded that the special public interest in banking activity extends to non-banking financial institutions, though different functional public interests in many cases clearly do. What is absolutely clear, in a world of increasing financial integration, is that neither the financial regulators nor the central bankers among you can expect an easy life!

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