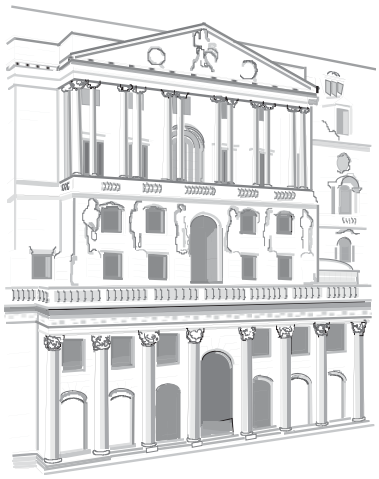
Bank of England Quarterly Bulletin



August 1995

Volume 35 Number 3

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Bank of England publications

Quarterly Bulletin and Inflation Report

Copies of the *Bulletin* and *Inflation Report* may be obtained from the Bank as a **combined** package; the *Inflation Report* is also available separately. The prices are as follows:

		Quarterly Bulletin and Inflation Report package		*Inflation Report* only	
		Annual subscription	Single copies	Annual subscription	Single copies (1)
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(1) There is a 25% discount if five copies or more are purchased.
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The concessionary rates for the combined *Bulletin*/*Inflation Report* package, the separate *Inflation Report* and pre-1994 issues of the *Bulletin* are noted above in *italics* and are available to **students in the United Kingdom** and also to **secondary schools in the United Kingdom**. Requests for concessionary copies should be accompanied by an explanatory letter: students should provide details of their course and the institution at which they are studying.

The *Bulletin* is also available on microfilm: enquiries from customers in Japan and North and South America should be addressed to University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106, United States of America; customers from all other countries should apply to White Swan House, Godstone, Surrey, RH9 8LW.

Bound volumes of the *Bulletin* for the period 1960 to 1985 (in reprint form for the period 1960 to 1980) can be obtained from Schmidt Periodicals GmbH, Dettendorf, D-83075 Bad Feilnbach 2, Germany, at a price of DM 180.00 per volume or DM 4,100.00 per set.

See page 298 for details of the annual *Statistical Abstract*.

The gilt market

'Investing in gilts: A guide for the small investor', providing basic information for small investors, and 'British Government Securities: The Market in Gilt-Edged Securities', intended for those with a professional interest in gilts and the gilt market, may be obtained from the Bank of England, PO Box 96, Gloucester, GL1 1YB.

Working Papers

The following ***Working Papers*** have been published in the last ten months:

No	Title	Author
27	Inflation, inflation risks and asset returns	Jo Corkish David Miles
28	The construction of RPIY	R Beaton P G Fisher
29	Pricing deposit insurance in the UK	David Maude William Perraudin
30	Modelling UK inflation uncertainty: the impact of news and the relationship with inflation	M A S Joyce
31	Measuring core inflation	Danny T Quah Shaun P Vahey
32	An assessment of the relative importance of real interest rates, inflation and term premia in determining the prices of real and nominal UK bonds	David G Barr Bahram Pesaran
33	Granger causality in the presence of structural changes	Marco Bianchi
34	How cyclical is the PSBR?	Joanna Paisley Chris Salmon
35	Money as an indicator	Mark S Astley Andrew G Haldane
36	Testing for convergence: evidence from nonparametric multimodality tests	Marco Bianchi

Issued by the Inflation Report Division, Bank of England, London, EC2R 8AH, to which enquiries regarding this *Bulletin* should be addressed. Telephone enquiries may be made to 0171-601 4030 and letters should be marked 'for the attention of the Publications Group'.

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The Quarterly Bulletin and Inflation Report

Inflation Report
(published separately)

The *Inflation Report* provides a detailed analysis of recent monetary, price and demand developments in the UK economy. Inflation on the Government's target (RPIX) measure was 2.8% in June; the RPIY measure of underlying inflation (which excludes the effect of indirect taxes) rose from 1.9% in March to 2.3% in June. Section 2 of the *Report* analyses the recent acceleration of the monetary aggregates. Sections 3, 4 and 5 consider the latest news on demand, output, the labour market and pricing behaviour, including the implications of the 'dual economy'. And Section 6 sets out the Bank's current assessment of the prospects for inflation over the next two years.

Operation of monetary policy (pages 221–30)

Official interest rates were unchanged during the second quarter. The decision not to raise rates in May surprised the markets: initially sterling fell to a new low on a trade-weighted basis and long-gilt yields rose; but these first reactions were quickly reversed. The Government announced proposals for a new tax regime for gilts and other bonds.

The international environment
(pages 231–39)

Growth has slowed in the United States, and was very low in Japan in the first quarter. It has remained generally strong in continental Europe, where inflation pressures have diverged; as a result, interest rates have been raised in some countries and cut in others. Non-oil commodity prices in dollars were on average $2^{1}/_{2}$% lower in the second quarter than in the first; oil prices ended the quarter only slightly higher.

Financial market developments
(pages 240–49)

Risk premia on a range of higher-risk assets fell in the second quarter, as confidence appeared to recover quickly from the turbulent conditions earlier in the year. But trading and issue activity in cash markets, and volumes on derivatives exchanges, were subdued.

Research and analysis
(pages 250–93)

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

Inflation targets (by Andrew Haldane of the Bank's Monetary Assessment and Strategy Division) summarises a number of the main issues—both technical and conceptual—raised by the use of inflation targets as the basis for a monetary policy framework. It draws on some of the contributions made by representatives of those central banks that use inflation targets at a conference on the subject organised by the Bank earlier this year.

The housing market and the economy (by Joanne Cutler of Structural Economic Analysis Division) summarises the recent historical trends in the UK housing market, and looks at the links between housing and the wider economy in recent years. It also considers how the relationship might be affected by an environment of sustained low inflation.

Company profitability and finance (by Mark Cornelius and Kieren Wright of the Structural Economic Analysis Division) assesses the evolution of firms' financial position over 1994 and 1995 Q1. Company profitability continued to improve rapidly in 1994. Investment by industrial and commercial companies fell, however, though there were marked differences between sectors. Stocks have been increasing; corporate debt has remained relatively high.

The Bank's new UK commodity price index (by Andrew Logan and Lucy O'Carroll) explains the construction of the Bank's new measure of commodity price pressures in the UK economy.

The behaviour of the foreign exchange market (by Professor Alan Kirman) examines what developments in economic theory can contribute to an understanding of the recent evolution of the foreign exchange market. It considers whether alternatives to the standard efficient-markets model can offer a better explanation of the market's actual behaviour.

Report
(page 294)

Banking statistics: summary of responses provides an update following the article in the February *Bulletin* which sought comments on the bids for new statistics.

Operation of monetary policy

- *During the second quarter, the Chancellor extended the Government's inflation objective beyond the end of the current parliament: the aim is a rate of inflation—measured by the twelve-month change in the retail prices index excluding mortgage interest payments—of 2½% or less.*
- *There were indications of significant cost pressures in the quarter, and there continued to be a marked contrast between domestic demand and the traded sector.*
- *Official interest rates remained unchanged during the quarter. The decision not to increase rates in May surprised the markets; initially, sterling fell to a new low on a trade-weighted basis and long-gilt yields rose, but market reaction subsequently steadied.*
- *The Government announced proposals for a new tax regime for gilts and other bonds, which are likely to facilitate the development of an official gilt strips market.*

Overview

Decisions on monetary policy are based on the analysis of a wide range of indicators. The Bank's current assessment is given in the August *Inflation Report*; this article reviews the operation of monetary policy in the second quarter of 1995.

In his Mansion House speech on 14 June, the Chancellor restated the Government's aim of achieving a rate of inflation of 2½% or less—measured as the twelve-month change in the retail prices index excluding mortgage interest payments. The aim is now to achieve this inflation target not just by the end of the current parliament but also in the longer run.

Statistics published during the quarter showed inflation on this measure running at just above 2½% (2.7% in the year to May); with indirect tax changes also excluded, inflation was lower but rising (to 2.2% in the year to May). There was also evidence of significant pressure on costs. Import prices rose by over 7% (not annualised) in the three months to March, more than could be attributed to the fall in the exchange rate over the period. But some of these pressures abated over the course of the quarter, as oil and other commodity prices eased. Manufacturers' input prices continued to rise (at an annualised rate of 6½% in the three months to May), but less rapidly than earlier. There was little evidence of any upward movement in pay settlements or average earnings, but with manufacturing output and productivity growth slowing, manufacturers' unit labour costs were no longer falling. Short-run measures of the change in manufacturers' output prices also fell, and the relative movements of input and output prices suggested a continuing narrowing of margins on domestic sales.

It became clear that output growth had slackened a little in the first quarter and very partial evidence suggested that this trend might have continued into the second quarter. There was a marked contrast between domestic demand, which fell in the first quarter, and a strong trade performance. A slight fall in consumption was

accompanied by a rise in the personal saving ratio, and the housing market continued to be weak. Business investment also fell in Q1 despite reportedly strong investment intentions.

Data indicated a slowdown in activity in the United States, which raised concerns that the 'soft landing' there might turn into a recession. However, there was less evidence of a slowdown in Europe (where strong industrial growth continued in France and Italy, but surveys suggested some slowing in Germany) and some increase in inflationary pressures—most noticeably in countries whose exchange rates had fallen.

Against this background, official interest rates remained unchanged throughout the quarter. The decision not to increase rates in May took the markets by surprise, and there was some concern that this might impair achievement of the Government's inflation target. Initially sterling fell to a new trade-weighted low of 82.7 and long-gilt yields rose. These first reactions were quickly reversed in the wake of a rally by the US dollar and a strong rise in bond markets internationally. Subsequently, somewhat weaker UK activity data led the markets to judge an early change in rates less necessary and to expect no change in the remainder of the quarter.

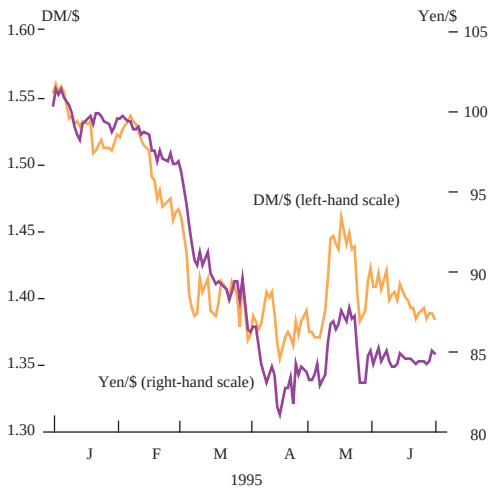
Foreign exchange markets

Some stability returned to the foreign exchange markets in the second quarter, with the major currencies trading in narrow ranges. The dollar exchange rate index fell by less than 1% in the quarter, in contrast to its fall of 7.5% in the first. Sterling moved sideways with the dollar, trading in a range between 84 and 85 on its effective rate index (ERI) for much of the period, before weakening late in June at the start of the election for the leadership of the Conservative Party.

The dollar's fall against the Deutsche Mark came to a halt at the start of April and it steadied at around DM 1.40, a level around which it traded for much of the quarter. Investors were attracted by the widening of interest rate differentials in the dollar's favour, as German money-market rates fell prior to the Bundesbank's decision to cut interest rates on 31 March.

With uncertainty surrounding the contents of the Japanese fiscal and monetary support package announced on Good Friday, the dollar was initially more vulnerable against the yen, despite a similar move in money-market interest rate differentials in its favour; it received support from concerted intervention on 5 April. The package, when announced, was widely regarded as disappointing; the $^{3}/_{4}$% cut in the Official Discount Rate had been widely discounted and the front-loading of already planned expenditure was thought to be insufficient to stimulate domestic demand from a very subdued level. The dollar fell back sharply, with concerns that the US-Japanese trade talks were reaching an impasse adding to the downward momentum. In illiquid markets on 19 April, it briefly touched an all-time low of ¥79.90 (after the close in London), before recovering to stabilise at around ¥84 before the meeting on 25 April of the Group of Seven (G7) countries. Despite the lack of action on exchange rates at that meeting, the general agreement on the need for an orderly reversal of the dollar's decline helped it to establish a base at these levels, where it traded for much of the rest of the quarter.

Dollar exchange rates(a)



(a) Close-of-business London prices.

Table A
Interest rates, gilt yields and exchange rates; selected dates[a]

	Interest rates (per cent per annum)					Gilt yields [b] (per cent per annum)				Exchange rates		
	Sterling interbank rates [c]				Short-sterling future [d]	Conventionals			Index-linked			
1995	1 month	3 months	6 months	12 months	3 months	Short	Medium	Long	Long	ERI	$/£	DM/£
3 April	6 5/16	6 23/32	7 1/32	7 5/8	7.64	8.32	8.42	8.35	3.86	85.0	1.6170	2.2190
4 May	6 25/32	7	7 7/32	7 11/16	7.60	8.14	8.27	8.19	3.72	84.4	1.6178	2.2164
6 June	6 13/32	6 9/16	6 23/32	6 31/32	6.85	7.38	7.69	7.75	3.55	84.3	1.5882	2.2517
22 June	6 11/32	6 19/32	6 25/32	7 3/32	6.86	7.69	7.98	8.02	3.64	84.1	1.6067	2.2248
30 June	6 5/8	6 29/32	7 5/32	7 1/2	7.17	8.19	8.46	8.44	3.80	83.4	1.5908	2.2021

(a) Close-of-business rates in London.
(b) Gross redemption yield. Representative stocks: short—8% Treasury 2000; medium—8½% Treasury 2005; long—8% Treasury 2015; index-linked—2½% Index-Linked Treasury 2016 (real yield assuming 5% inflation).
(c) Middle-market rates.
(d) Implied future rate: September 1995 contract.

Sterling's effective exchange rate index

Sterling was on the sidelines for much of April. It made some progress against the weakening dollar, but failed to push through the $1.60–$1.61 area. As a result, it fell sharply with the dollar against the Deutsche Mark, from around DM 2.22 in the early part of April, and touched an all-time low of DM 2.1795 on 19 April. It then rebounded with the stronger dollar; and following the publication of data on UK activity that were stronger than market expectations (in particular, the initial Q1 GDP data released on 25 April), it was supported by widespread expectations of an interest rate rise following the Chancellor/Governor meeting on 5 May.

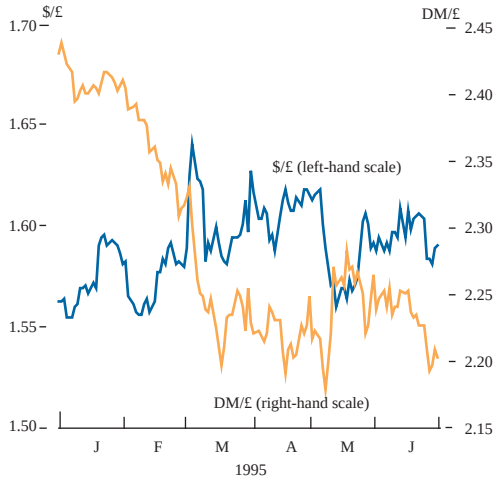
The decision not to raise interest rates at this meeting confounded market expectations and led initially to a sharp sell-off in sterling, on concerns over its implications for the inflation outlook and for the credibility of the monetary policy framework. Sterling hit new all-time lows of DM 2.1765 and 82.7 in effective terms on 9 May. This initial reaction was, however, quickly reversed as the dollar strengthened. Sterling was also helped by comments by the Chancellor and the Governor that made it clear that there was no disagreement between them on the ultimate policy objective of permanently low inflation. Sterling moved back into the 84–85 range on the ERI, where it stayed until it was unsettled by political events at the end of June.

The dollar traded in narrow ranges of ¥83.5–¥85 and DM 1.38–DM 1.41 for much of May and June. Interest rate differentials remained more or less unchanged as the news of a marked slowdown in the US recovery was matched by serious concerns over recession in Japan and indications of slower monetary growth in Germany; all of these led to a worldwide easing of interest rates across the yield curve. In the absence of changes in underlying economic fundamentals, technical factors and market liquidity were very important in determining exchange rate movements. This was particularly true during mid-May when the dollar briefly moved out of its trading ranges. In illiquid Ascension day markets, it rose sharply on 9 May after breaking through a key resistance level at DM 1.395 and taking momentum from a strong bond-market rally. In a short squeeze it moved up to DM 1.44 and ¥85, where it traded until 25 May. However, the combination of indications of weakening US activity (particularly in the employment data) and frustration over the lack of further progress by the dollar led investors to reduce their long dollar positions. In thin markets aggravated by a bunching of international holidays, the dollar fell back sharply to hit the floor of its recent trading range at DM 1.38.

It was moved off this level by the concerted intervention on 31 May. In contrast to some of the other recent episodes of intervention, this was perceived by the market to have been successful and initially pushed the dollar up to DM 1.41. The main reasons for the success of the operation included its timing (the market seemed to be short of dollars relative to desired neutral holdings following the end-May sell-off, and there was already strong demand for the dollar), its unexpectedness and the link with the G7 communiqué issued on 25 April which, as well as establishing a clear motivation for the intervention, also raised the possibility of further intervention around the time of the G7 summit on 15/16 June.

However, the lack of policy action and further weak US data soon reduced the effect of the intervention. The dollar moved back to the bottom of its trading range, weakened by concerns over the continued lack of progress on the US/Japanese trade talks and the threatened implementation of sanctions on 29 June. It finished the month slightly more strongly, following the last-minute agreement between the US and Japanese trade negotiators.

Sterling exchange rates

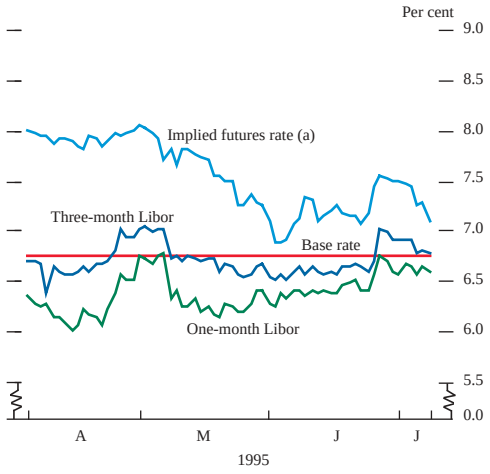


Sterling tracked the dollar throughout May and June. Evidence of some moderation in the pace of UK activity (from continued weakness in the housing market and downward revisions to Q1 GDP growth) reduced market expectations of a near-term interest rate rise. Sterling was little affected by this, as the UK situation was seen to be in line with the general fall in worldwide interest rate expectations. However, towards the end of June, heightened political uncertainty weighed on sterling (although initially not as heavily as in the UK domestic markets).

The announcement of the election contest for the leadership of the Conservative Party had little immediate effect. The market consensus at the time was that there was little prospect of the contest going to a second round and that the incumbent would probably emerge with his position strengthened. However, as it became less clear that a second round could be ruled out, uncertainty over the outcome, and its implications for the future conduct of monetary and fiscal policy, led sterling to move lower: it equalled its all-time low of 82.7 on its effective rate index on 27 June. After the election result, sterling strengthened but did not immediately return to its pre-election levels.

In Europe, tensions in the ERM eased after the turmoil of March, helped by the decline in German interest rates. The Deutsche Mark fell back against most European currencies following comments by Bundesbank Council members that a permanently overvalued currency was not in Germany's interests. The French franc fell a little around the time of the presidential election in May, with the market unsure of the commitment of either of the second-round candidates to the established strong exchange rate policy. The French franc reached FFr 3.5791 against the Deutsche Mark on 5 May, just 1.5 centimes away from the all-time low it reached in the ERM turmoil in March. It regained most of the lost ground in the weeks after the election, but because of its volatility France, unlike the Netherlands and Belgium, was unable immediately to follow Germany's lead on 31 May and cut its interest rates. But rates in France were cut when the government introduced its budget package on 27 June.

Short-term interest rates



(a) Three-month Libor implied by December 1995 futures contract.

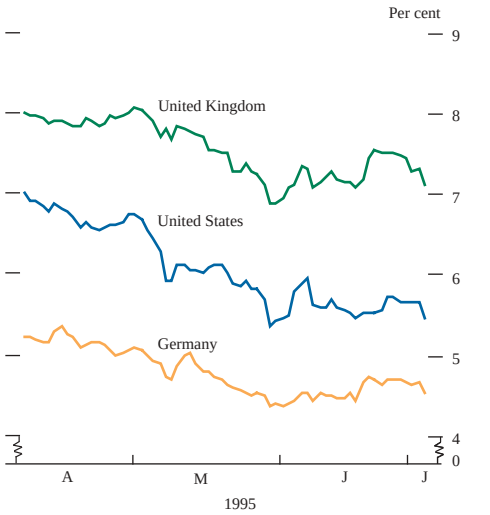
Table B
Influences on the cash position of the money market

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

	1994/95	1995/96		
	Apr.–Mar.	Apr.	May	June
Factors affecting the market's cash position				
Under/overfunding (+/-) (a)	11.0	0.8	4.2	0.3
Other public sector net borrowing from banks and building societies (-) (b)	2.0	-0.6	0.6	0.4
of which, local authorities' deposits with banks and building societies (+)	*0.6*	*-0.4*	*0.3*	*0.2*
Currency circulation (-)	-0.4	-0.4	0.6	-1.0
Other	0.7	2.8	-3.2	4.3
Total	**13.3**	**2.6**	**2.2**	**4.1**
Increase (+) in the stock of assistance	-8.5	-1.6	-0.3	-0.6
Increase (-) in £ Treasury bills outstanding (c)	4.8	1.0	1.8	3.2
Increase in bankers' balances at the Bank	—	—	—	0.2

(a) From 1993/94, net purchases of central government debt by banks and building societies are included in funding. Purchases by banks and building societies in 1992/93 are counted as funding in 1994/95.
(b) From 1993/94, banks' and building societies' purchases of local authorities' and public corporations' listed sterling stocks and bonds are included in funding.
(c) Other than those held outright by the Bank and government accounts, but including those purchased by the Bank on a repurchase basis.

Three-month interest rates implied by December 1995 futures contracts



Official money-market operations

Official interest rates remained unchanged throughout the quarter. Markets continued to expect some further increase, especially in the run-up to the May meeting between the Chancellor and the Governor. But when none resulted on that occasion, the market revised its expectations to later—and smaller—increases. Period rates rose at the end of the quarter, as a reaction to the heightened political uncertainty caused by the Conservative Party leadership election.

Short-term rates were below official dealing rates and base rates for much of the quarter; daily market shortages remained low in April and May, and larger banks continued to benefit from inflows of funds following the collapse of Barings. Some deviation between official and market rates is normal, and indeed gives useful information to the Bank in its implementation of policy. But a prolonged divergence may put the stance of policy in doubt, and the Bank gradually became less accommodating in its operations. This—together with an increase in the size of daily shortages in June—tightened conditions in the market and brought market rates back up towards official rates.

International monetary conditions continued to have an important influence on UK markets. Evidence of slower growth in the United States and the possibility of an easing in US monetary policy led to easier money-market conditions there and elsewhere. The three-month rates implied by December 1995 dollar and Deutsche Mark futures contracts declined during April and May, and steadied or rose slightly in June. The rates implied by sterling contracts moved in a similar pattern during the quarter.

At the beginning of the quarter, market expectations were not firmly held. Market rates reacted to each piece of economic news, and the volatility implied by options on the short-sterling contract was high. But as the monthly Monetary Meeting in May approached, the markets—influenced by GDP data showing faster growth than the monthly indicators had suggested, and by publication of the March minutes, which drew attention to concern over the fall in the exchange rate—became more convinced that a tightening was imminent. The decision to leave rates unchanged came as a surprise. In an immediate technical adjustment to the news short-sterling contracts rallied, though much of this was reversed shortly afterwards when the Bank's *Inflation Report* projected that RPIX inflation would rise to close to the top of its 1%–4% target range in 1996 and, despite declining thereafter, would still be in the top half of that range in the first quarter of 1997.

In the rest of May, expectations of a rate rise in June were briefly kindled by the increase in input and RPIY inflation, but subsequent data—particularly weak retail sales figures and a downward revision to GDP—led the market virtually to rule out a rise by the time of the June meeting. The market was also influenced by a global bond-market rally, which pushed down money-market rates in most major centres abroad.

The announcement of an election for the leadership of the Conservative Party had little initial impact on the money markets but as the possibility of a second round was seen to increase and as sterling slipped, money-market rates rose—although without any

Debt Management Review

On 19 July, H M Treasury and the Bank of England issued the Report of the Debt Management Review. This box reproduces the executive summary of the Report.[1]

The Debt Management Review, which was announced by the then Minister of State to the Treasury on 10 November 1994, had the following terms of reference:

> 'To review the existing arrangements for the setting of debt management policy, the selling of government debt and the management of outstanding debt.'

The Review covers gilt issuance only. It does not cover National Savings. It was conducted by the Treasury's Debt and Reserves Management Team and involved an extensive process of consultation. The Review was conducted in close coordination with the Bank of England.

This joint Report by the Treasury and the Bank of England contains the conclusions of the Review, and also discusses a number of other current developments in the gilts market. It covers the following principal issues:

(i) **Objectives**: The Government has decided to change the stated objectives of debt management policy to reflect current practice more accurately. The primary objective of debt management policy is to minimise over the long term the cost of meeting the Government's financing needs, taking account of risk, whilst ensuring that debt management policy is consistent with monetary policy.

(ii) **Funding rule**: Beginning in 1996/97, the Government has decided to introduce a new framework for financing, which will continue to ensure a prudent maturity structure for debt issuance. The Government will aim to sell sufficient gilts of any maturity, Treasury bills and National Savings products to finance the Central Government Borrowing Requirement (CGBR) (plus maturing debt and any net increase in the official foreign exchange reserves). All such debt issuance will take place within a set maturity structure, to be determined and published each year. The Government has no current plans to make significantly greater use than at present of short-term debt issuance. This change will not affect the amount the Government needs to borrow, or change the PSBR's role as a fiscal control aggregate.

(iii) **Debt Management Report:** The Government will publish an annual Debt Management Report and Remit to the Bank of England, setting out advance details of the annual issuance programme, including an auction timetable and the maturity structure of issuance for the forthcoming financial year. The first such Report was published in March 1995.

(iv) **Auctions**: Auctions will constitute the primary means of conventional gilt issuance. The authorities will consider the possibility of using uniform-price auctions, on an experimental basis.

(v) **Tap sales**: In order to improve predictability and transparency, the authorities will make a number of changes to the process by which tap and 'unofficial' sales are made. In future, conventional tap sales will function primarily as a market management mechanism, and will not normally constitute more than 10% of total issuance.

(vi) **Index-linked**: The authorities will seek views on the development of the market in index-linked gilts. The Bank of England has arranged a conference for September on index-linked government debt.

(vii) **Tax**: Next year's Finance Bill will provide that from April 1996 all returns on gilts should be taxed as income for corporate holders. This will increase market efficiency, and facilitate the introduction of a strips market.

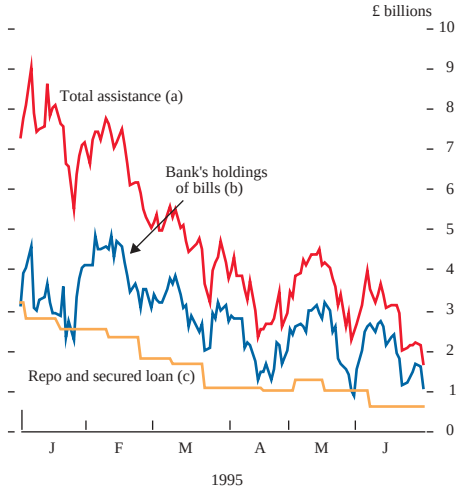
(viii) **Market structure**: An open gilt repo market will be introduced in January 1996; an official gilt strips facility will be introduced subsequently, but not before the second half of 1996.

(ix) **Consultation**: The authorities will introduce a formal consultation process to enable them to ascertain the views of market participants on strategic debt management policy issues.

Some of these proposals have already been implemented; others are not firm decisions, but are subject to consultation and further consideration. The Government and the Bank of England believe that these changes, taken together, will increase the liquidity and efficiency of the gilts market, and should reduce funding costs, to the ultimate benefit of taxpayers.

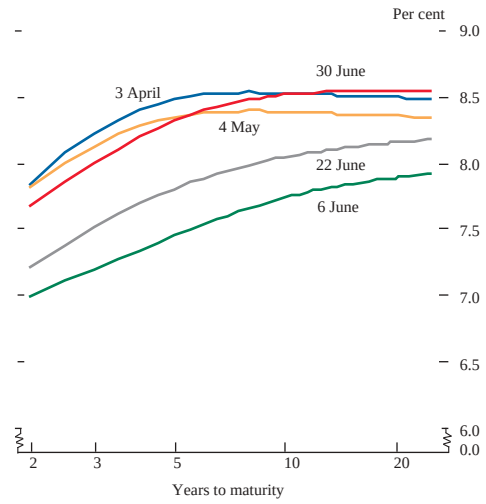
(1) The Bank is publishing research that it undertook in connection with the Debt Management Review. The papers can be obtained by contacting the Publications Group, Bank of England (on 0171–601–4030).

Money-market assistance



(a) Bank of England's holdings of bills, market advances and funds supplied under the repo and secured loan facilities.
(b) Bank of England's holdings of eligible bank bills outright and on a repurchase basis and sterling Treasury bills on a repurchase basis.
(c) Bank of England's holdings of gilt-edged stocks on a repurchase basis, and loans made against export and shipbuilding credit-related paper under repo and secured loan facilities.

Par yield curves for British government stocks



UK implied bond market volatility(a)

(a) The expected standard deviation of annualised price movements in LIFFE's long-gilt future.

serious expectation of a rise in official rates. The rise in market rates essentially reflected greater uncertainty: the implied volatility on the September short-sterling contract rose sharply to over 19%. After the end of the quarter, when the result of the leadership election was known, money-market rates fell back, though not to the levels seen before the election had been announced.

Gilt-edged funding

Gilts had a mixed quarter, gaining substantial ground in May before falling back to close very little changed over the period as a whole. Ten-year yields traded in a range of 109 basis points. After opening the quarter at 8.40%, they fell to a 15-month low of 7.68% in early June before rising again to close at 8.43%. The rally resulted primarily from the influence of international sentiment, but was also helped by weaker domestic data releases in May. The reversal was brought about mainly by the political uncertainties which weighed on the market prior to the Conservative Party leadership contest.

Sentiment in international bond markets was influenced by US data releases, which showed a slowdown in activity and which increased expectations that the Federal Reserve might ease its policy. Sentiment towards the possibility of a rate cut in Germany was mixed: although there had been some expectation, helped by subdued data and a slight fall—to 4.50%—in the lowest accepted rate on the variable repo, it had largely dissipated by the end of the quarter, when the figure for inflation was higher than forecast following higher-than-expected wage settlements.

Spreads between gilts and US government bonds had risen from around 100 basis points at the start of the year to 140 basis points by the end of the first quarter; they rose further to 230 basis points by end-June. Against German government bonds, there was less of a rise, from a similar starting-point of 100 basis points to 130 by end-March and 140 by end-June. As the chart of implied bond-market volatility suggests, the particularly large spreads at the end of June in part reflected uncertainty—both political, related to the Conservative leadership election, and technical, related to the fundamental reform proposed for the taxation of gilts consultation on which straddled the end of the quarter.

Real yields, like conventional yields, were little changed over the quarter; the simple comparison would suggest little change in the market's inflation expectations over the quarter as a whole. If UK real yields are a measure of real yields worldwide, the implication of widening spreads between conventional gilts and other major government bonds would be that there was a fall in the market's expectations of inflation in other countries.

There were some movements in the differential between UK index-linked and conventional yields during the quarter, but as these often coincided with movements in implied volatility, they should be treated with some caution. The spread between conventional and index-linked yields also narrowed in late May to around 4.4%, as the proposals for the reform of the taxation of gilts caused some concern; there was initially some misunderstanding that the whole of the nominal return on index-linked gilts might be taxed. Once this was clarified, there remained some concern that the method for ensuring that only the real return was taxed had not been decided. Towards the end of the quarter, index-linked stocks outperformed

Changes to the taxation of gilts and the development of an official strips market

On 25 May, the Inland Revenue published a consultative document on proposed changes to the taxation of gilts and bonds. The Bank of England simultaneously published a consultative paper on the development of an official gilt strips facility,[1] which would be made possible by changes in the tax arrangements. Both consultation periods ended on 30 June.

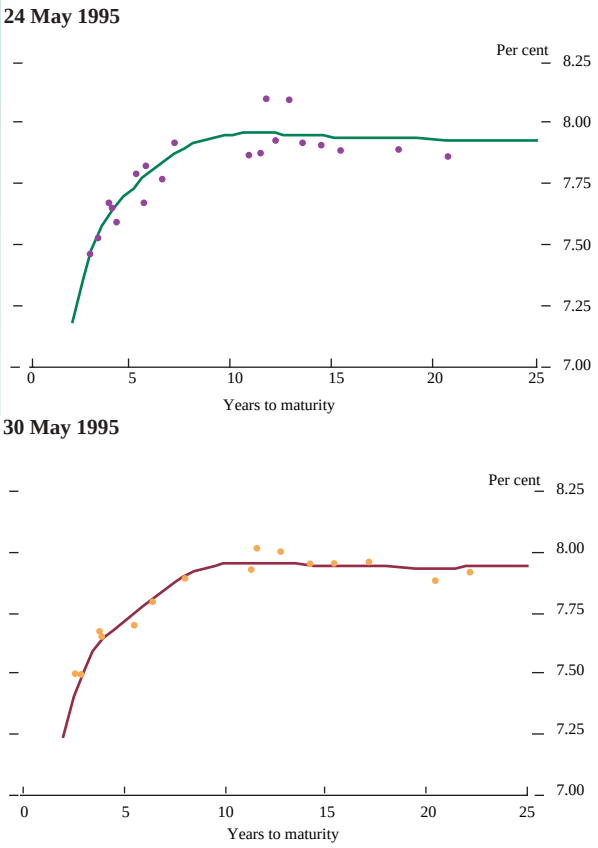
The Inland Revenue proposed a regime in which the distinction between capital gains and income would be removed; a bond would be taxed on its total return, with relief given against capital losses.

The Bank's paper suggested that there might be demand for strips from a wide range of investors: those seeking a specific set of cash flows or wanting to avoid reinvestment risk; those familiar with strips in other markets; retail investors saving for outlays due to start a number of years ahead; and institutions wishing to match their long-term liabilities more accurately with the more distant coupon and principal repayment components of a coupon bond. Overseas investors might be attracted to an investment on which it was easier to effect a currency hedge. The paper pointed out that under the current tax arrangements, strips would add to tax distortions and increase the scope for tax-avoiding strategies. Tax reform was therefore a necessary precondition for the introduction of strips.

The immediate impact of the announcement on gilt prices was as expected:[2] high-coupon stocks outperformed low-coupon stocks and so the yield spread between high and low-coupon stocks narrowed, as stocks moved closer to the par yield curve (see the chart); implied volatility increased as the market assessed the proposals; and the premium on high duration/convexity stocks was marginally reduced.

The Chancellor announced on 10 July that the tax proposals would go ahead, with some modifications. During the consultation period, concerns had been expressed about the impact that the changes would have on personal investors and about the proposal that the start date for the new regime would be the date on which the decision to go ahead was announced. The Chancellor announced that for personal investors the threshold below which the new arrangements would not apply would be set at nominal holdings of £200,000; that the new arrangements would not apply to two stocks that are widely held by private investors (3½% Funding 1999/2004 and 5½% Treasury Loan 2008/12); and that the start of the new arrangements would be delayed until 1 April 1996 for corporate investors and 6 April 1996 for personal investors. It was also announced that there would be special rules to ensure that gilt and bond unit trusts are not disadvantaged and that there is tax exemption for corporate bond PEPs. All non-equity shares—including zero-coupon preference shares—would be outside the new regime.

Position of stocks relative to the par yield curve[a]



(a) The yield curve model used to produce the charts employ a cubic spline function to provide accurate fit to the data.

The Bank announced on the same day that an official strips market would go ahead. The proposals in the Bank's consultative paper had received widespread support from traders and institutional investors, indicating that there was clearly demand for a strips facility. The Bank will announce details after further discussion with the market. The facility will not be introduced before the second half of 1996, allowing the new gilt repo market six months to settle down.

(1) *Stripping* a bond is the process of separating a standard coupon bond into its constituent interest and principal payments, so that they can be held separately or traded as zero-coupon instruments. It allows investors to choose their own cash flows more precisely. An official strips facility will enable investors to exchange a coupon gilt for a series of zero-coupon strips exactly matching the cash flows of the parent bond and each of which is an obligation of the UK government. Investors will also be able to reconstitute a gilt, ie to exchange a series of strips for a coupon gilt.

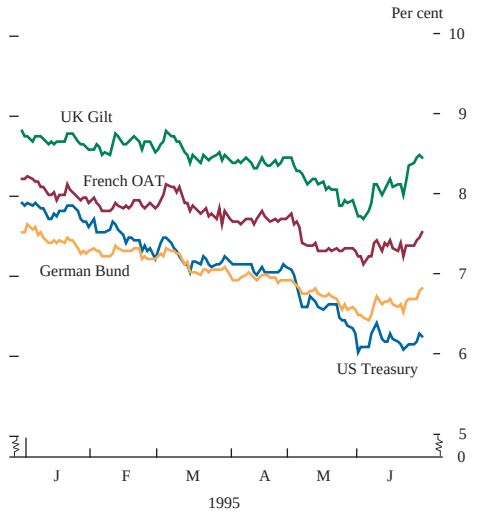
(2) The tax reform would benefit high-coupon stocks trading above par, since tax relief would be available for the capital losses that would result if any of these bonds were held to redemption. Yields on low-coupon stocks trading below par would increase, because the capital gains that accrue as redemption is approached would be taxed.

Table C
Issues of gilt-edged stock

	Amount issued (£ millions)	Date announced	Date issued	Method of issue	Price at issue (per £100 stock)	Details of payment	Yield (a) at issue	Yield (a) when exhausted	Date exhausted
2½% Index-Linked 2013	150	5.4.95	5.4.95	Tap	132.8125	Fully paid	3.81 (b)	3.81	6.4.95
2½% Index-Linked 2003	150	5.4.95	5.4.95	Tap	165.1875	Fully paid	3.81 (b)	3.81	6.4.95
2½% Index-Linked 2020	150	7.4.95	7.4.95	Tap	136.6875	Fully paid	3.80 (b)	3.80	26.4.95
2½% Index-Linked 2009	150	7.4.95	7.4.95	Tap	156.8750	Fully paid	3.76 (b)	3.77	26.4.95
8% Treasury 2000 'A'	2,000	18.4.95	27.4.95	Auction	98.6563 (c)	Fully paid	8.30	8.30	5.7.95
2½% Index-Linked 2024	100	2.6.95	2.6.95	Tap	120.6875	Fully paid	3.54 (b)	3.74	5.7.95
2½% Index-Linked 2011	100	2.6.95	2.6.95	Tap	170.4375	Fully paid	3.51 (b)	3.73	26.4.95
8% Treasury 2013	200	2.6.95	2.6.95	Tap	102.1875	Fully paid	7.77	7.75	5.6.95
8% Treasury 2013	100	2.6.95	2.6.95	To CRND	102.1875	Fully paid	7.77		
7% Treasury 2001	200	2.6.95	2.6.95	Tap	97.1250	Fully paid	7.56	7.55	5.6.95
7% Treasury 2001	100	2.6.95	2.6.95	To CRND	97.1250	Fully paid	7.56		
8½% Treasury 2005	2,500	20.6.95	30.6.95	Auction	100.4688 (d)	Fully paid	8.42	8.42	30.6.95

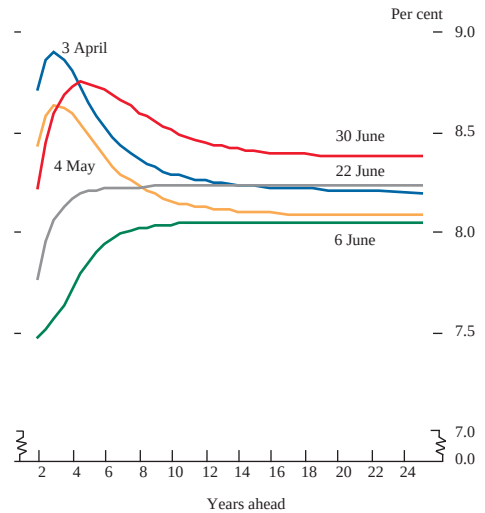
(a) Gross redemption yield, per cent.
(b) Real rate of return, assuming 5% inflation.
(c) Lowest-accepted price for competitive bids, and the non-competitive allotment price.
(d) Lowest-accepted price for competitive bids. The non-competitive allotment price was £100.50.

Ten-year government bond yields(a)



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

Implied forward rates(a)



(a) Annualised six-month interest rates derived from zero-coupon yield curve.

conventional gilts as political uncertainties set in. The yield on the eleven-year Treasury 2% 2006 fell to 3.38% before climbing again to close the quarter at 3.72%. The yield spread between the 2013 index-linked and conventional stocks reached a low of 422 basis points early in June (toward the end of the rally), but widened before the leadership contest to a high of 4.73 basis points. The restatement of the inflation target had little impact.

The Chancellor's decision to leave interest rates unchanged in May took the market by surprise; there was some concern that this might impair achievement of the Government's inflation target. The long-gilt future fell immediately by ten ticks and seemed liable to fall further. However, it was then helped by a sharp improvement in US sentiment following a weaker-than-expected employment report, and the future rose to close at a new high of 105–00 in high volumes of over 96,000 contracts. The gilt market largely ignored sterling's fall to below DM 2.19. Subsequent domestic data were seen as generally soft and removed any expectation of an interest rate move in the remainder of the quarter.

The proposals for a new tax regime for gilts and bonds, announced by the Inland Revenue on 25 May (see the box on page 228), influenced activity in the gilt market. Widespread 'bed-and-breakfasting' of gilts was reported (which added artificially to turnover), in response to uncertainty as to whether the arrangements would include a 'kink test' (this would ensure that investors were not taxed on more returns than they actually made or relieved on more losses than they suffered). The Bank's proposals for the development of an official strips facility (published on the same day) were broadly welcomed in the market. The market appeared fully to expect the proposals to come into force, and distortions in the yield curve were greatly reduced as the *coupon effect*—the incentive for high taxpayers to hold low-coupon gilts—largely disappeared. The rally in May was not marked by any issues of tap stocks, because of the imminence of the publication of the Revenue's proposals for the reform of the taxation of gilts and other bonds.

The annual funding remit for 1995/96 was issued to the Bank by the Treasury at the end of March. It included an auction calendar, giving dates of the eight auctions in the coming year; maturity ranges are to be announced shortly before the beginning of each quarter. The two auctions held in the first quarter of the new financial year were both successful. The April auction of £2 billion

Table D
Official transactions in gilt-edged stocks

£ billions: *not seasonally adjusted*

	1994/95 (a)	1995/96		
	Apr.–Mar.	Apr.	May	June
Gross official sales (+) (b)	29.8	2.9	-0.1	2.9
Redemptions and net official purchases of stock within a year of maturity(-)	8.3	—	0.2	—
Net official sales (c)	21.5	2.9	-0.3	2.9
of which net purchases by:				
Banks (c)	0.7	-0.1	0.1	0.3
Building societies (c)	-0.5	0.2	-0.5	0.3
Overseas sector	-5.6	0.9	0.3	1.0
M4 private sector (c)	26.5	1.9	-0.2	1.2

(a) Later instalments are included in the month when they fall due, not in the month when the sale is secured.
(b) 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.
(c) Excluding transactions under purchase and resale agreements.

of 8% Treasury 2000 'A' tranche was covered 2.17 times with no tail—the yields corresponding to the average and lowest-accepted bids were the same. The reason for issuing an 'A' tranche was that the parent stock was due to go ex-dividend a few days after the auction and might have been unattractive to those not wanting to receive coupon. The 'A' stock was fungible with the parent on the ex-dividend date (1 May) but bore a lower first coupon.

The June auction was delayed by a day in order to give the market time to digest the Government's summer forecast published on 28 June. Despite upward revisions to the borrowing requirement and inflation forecasts, there was little market reaction. The auction of £2.5 billion of 8½% Treasury 2005 took place against a background of political nervousness during the Conservative leadership election. However, its benchmark status and its inclusion in the basket of stocks deliverable into LIFFE's long-gilt futures contract made the stock attractive to a wide range of investors. The auction was twice covered and there was no tail.

The results of a new survey of gilt holdings have now been published in the Bank's Review of Gilts and the Gilts Market 1994–95.(1) They show an estimated decline between March and December 1994 in the gilts held directly by individuals. Banks and other financial institutions increased their holdings, while overseas investors were small net sellers. Overseas holders continued to make net sales of gilts in the first quarter of 1995, but were net buyers in the second quarter.

Total gilt sales in the second quarter of 1995 amounted to £5.7 billion. In addition to the £4.5 billion raised through auctions, the Bank also made tap issues of both conventionals and index-linked stocks.

At the end of the quarter, the Bank announced that the auctions in the third quarter would be in the maturity ranges 2014 to 2016 for the auction on 26 July, and 2005 to 2007 for that on 27 September.

(1) The Review may be obtained from the Bank of England, PO Box 96, Gloucester GL1 1YB.

The international environment

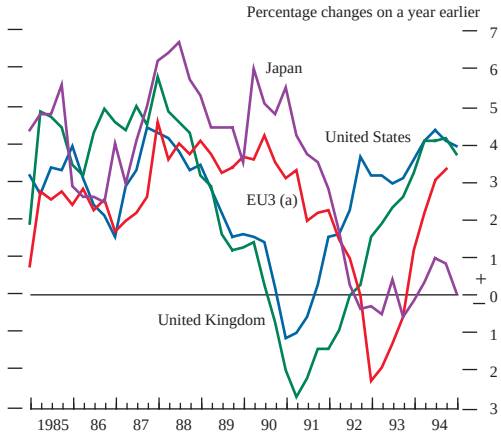
- *In the first quarter of 1995, growth slowed in the United States and was very low in Japan. In continental Europe, the recovery remained generally strong; and growth rates quickened in some economies. In the second quarter, US growth weakened further.*

- *Non-oil commodity prices were, on average, 2½% lower in the second quarter than in the first, according to the dollar-denominated Economist index. Oil prices rose sharply and then fell: by June, they were only slightly higher than in March.*

- *Producer and consumer price inflation have risen in those major economies whose currencies have depreciated this year.*

- *Inflationary pressures have diverged within Europe; as a result, official interest rates have been raised in some countries and cut in others.*

Chart 1
GDP in the major economies



(a) A GDP-weighted average of France, Italy and western Germany.

Overview

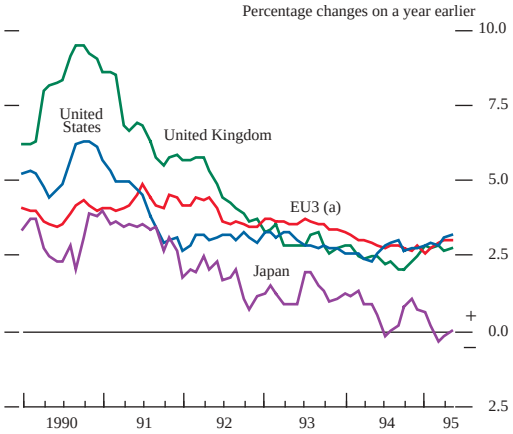
Economic growth slowed in North America in the first quarter. In the United States, GDP grew by 0.7%—only half as fast as in the previous quarter. But domestic demand slowed less than total growth. The slowdown followed increases in interest rates last year and at the beginning of this, and 16 consecutive quarters of growth; firms may increasingly have been approaching capacity constraints. In the second quarter US growth weakened further, according to monthly data. Firms have cut back production, probably to reduce stocks; and falling production has fed through to lower manufacturing employment, which has in turn influenced consumer confidence and, probably, consumption. Unexpected delays in receiving tax rebates may have contributed to the slower retail sales growth. In Canada, GDP grew by only 0.2% in the first quarter, after four consecutive quarters of growth above 1%.

In Japan, the earthquake in January affected activity in the first quarter. Very low growth in that period followed a large fall in GDP in the fourth quarter of 1994. Although the economy appeared to be recovering last year, GDP in 1995 Q1 was virtually unchanged from a year earlier and no higher than at the end of 1991.

In Europe, growth remained strong in Italy and Spain, but slowed slightly in France and, perhaps, in Germany. French GDP grew by 0.7% in the first quarter, but consumption increased by only 0.4% after falling in the fourth quarter of last year. Uncertainty over the result of the presidential election may have been a temporary factor reducing spending, but high unemployment may continue to subdue confidence—and therefore consumption—for some time. Chart 1 shows that the annual growth rates of the major economies have converged at above 3%, except in Japan.

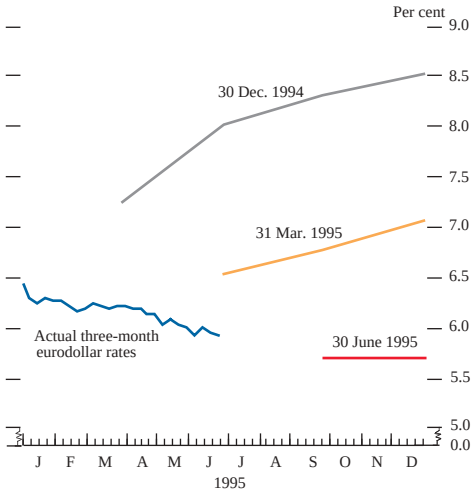
Between December and May, annual consumer price inflation rose in every Group of Seven (G7) country whose nominal effective exchange rate depreciated over the period. It rose particularly fast

Chart 2
Consumer prices in the major economies



(a) A GDP-weighted average of France, Germany and Italy.

Chart 3
US three-month interest rates(a)



(a) The path of three-month US dollar rates implied by the prices of futures contracts on the dates indicated.

Table A
Contributions to US GDP growth

Percentage points (a)

	1993 Year	1994 Year	1994 Q4	1995 Q1
Consumption	2.2	2.4	0.8	0.3
Total investment	1.6	1.9	0.5	0.6
Government expenditure	-0.1	-0.1	-0.2	—
Stockbuilding	0.3	0.6	-0.1	—
Domestic demand	**4.0**	**4.8**	**1.1**	**0.9**
Net external trade	-0.8	-0.7	0.2	-0.2
GDP	**3.1**	**4.1**	**1.2**	**0.7**

(a) Quarterly contributions are relative to the previous quarter. Components may not sum to total because of rounding.

in Italy. But as Chart 2 shows, inflation in the G7 countries remained generally lower than in the early 1990s. In a number of other countries, for example Spain, inflation has risen significantly since the start of the year; most of these countries have undergone exchange rate depreciations.

In the same period, producer price inflation rose in every G7 economy except Japan. Even in Germany, where the effective exchange rate appreciated by 3½% in the first five months of the year, annual producer price inflation rose by 0.3 percentage points. Non-oil commodity prices fell in the second quarter, but producer prices may still be adjusting to the rise in commodity prices during 1994.

Official interest rates were raised in Finland, Italy, Spain and Sweden in the second quarter as consumer and producer price inflation increased. The cut in official interest rates in Germany at the start of the quarter triggered reductions in other ERM member countries. And as exchange rate fluctuations diminished over the period, further cuts were implemented. The Bank of France reintroduced its 5–10 day repurchase rate and cut it by 25 basis points at the end of the second quarter, and again at the start of the third.

Chart 3 shows the large change in the expected future path of US interest rates during the first half of the year. The change in expectations was mainly the result of a faster slowdown in activity than had previously been expected. Early in the third quarter, the US federal funds rate was cut by 25 basis points to 5¾%—the first cut since 1992. The reduction was matched by the Bank of Canada, which had reduced interest rates three times in the preceding five weeks.

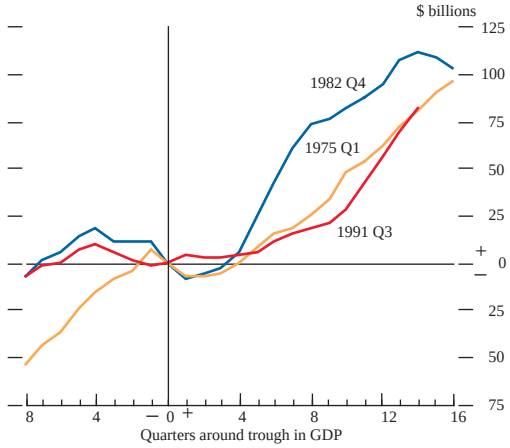
The US economy grew by around ¾% in the first quarter, but probably by much less in the second

In the United States, GDP grew by 0.7% in the first quarter, significantly less than its 1.2% growth in the previous quarter. But there was much less of a slowdown in growth in domestic demand—which fell from 1.0% to 0.9% and remained above its average over the past 30 years. Table A shows that consumption's contribution to growth fell in the first quarter and that net trade reduced growth. Following the devaluation of the Mexican peso in December and the subsequent slowdown in activity there, US net exports to Mexico fell by more than $3 billion in the first quarter. This more than offset an increase in net exports to the rest of the world.

Monthly indicators suggested a further slowdown in activity in the second quarter. Industrial production fell between March and June; and non-farm employment growth slowed significantly in the quarter. By June, capacity utilisation in industry had fallen by two percentage points from its recent peak of 85.5% at the start of the year. But this may have reflected increased capacity as a result of past investment as well as falling production.

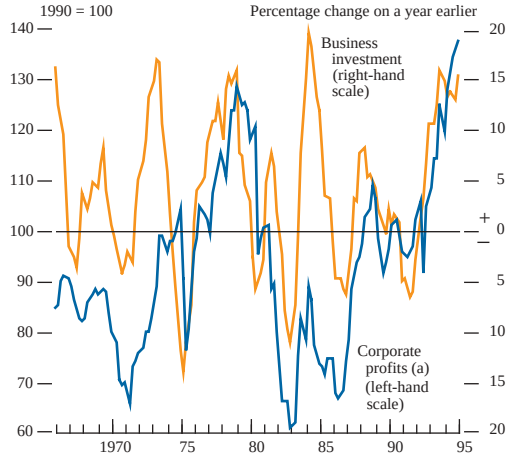
The cause and extent of the slowdown are still uncertain. US interest rates and bond yields increased sharply in 1994, and some sectors of the economy may have been hitting capacity constraints by the end of the year. Production may have been cut back to

Chart 4
United States: stock accumulation over the cycle(a)



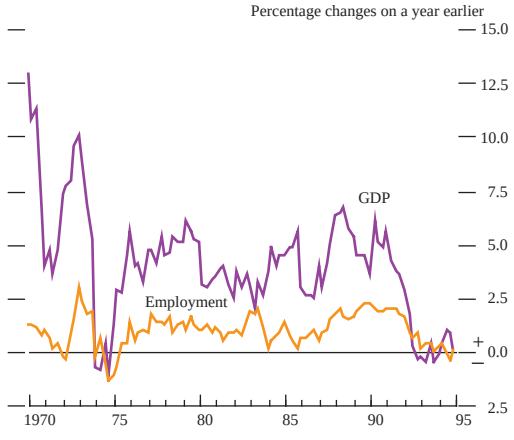
(a) In constant prices; dates shown indicate the quarter in which the trough in output was reached.

Chart 5
United States: corporate profitability and business investment



(a) Before tax, in constant prices.

Chart 6
Japan: GDP and employment



prevent stocks rising further. As Chart 4 shows, the accumulation of stocks during this recovery has not been out of line with previous cyclical experience.

After a period of sustained growth, it is not unusual for industrial production to grow more slowly than whole-economy output; for instance, between 1984 and 1986 US GDP grew more than twice as quickly as industrial production. Increased flexibility of labour markets may have allowed US firms to adjust employment to revised production plans more easily than in the past, as suggested by the accumulated fall of 104,000 in manufacturing employment in the second quarter. So a slowdown in industrial production growth may now have wider effects on the economy than in previous cycles.

Growth in the volume of retail sales slowed significantly in the second quarter. There are a number of reasons why consumers may have cut back their spending plans so far this year. First, a desire to increase savings: the household saving ratio had fallen to 3.6% of disposable income at the start of last year—its lowest level since 1989—but recovered to 5.1% by the first quarter. In the face of falling employment, confidence has fallen and consumers may have wished to raise precautionary savings further. Second, a temporary reduction in disposable incomes: there was a surprise delay in tax rebates in the second quarter; these were reported to be worth an average of $1,000 per household.

Faster growth may resume in the second half of the year, as falling long-term interest rates so far this year feed through to cheaper mortgages and consumer credit. Consumption may also be boosted as tax rebates are received. And in the corporate sector, pressure to cut costs may not be high, and further growth in corporate investment may more easily be financed internally; corporate earnings were at their highest level for at least 30 years in the first quarter. Chart 5 shows the past correlation between corporate profits and investment. Although the dollar stabilised against a basket of currencies in the second quarter, it was still 10% lower in June than a year earlier. So net exports may contribute to growth as the depreciation feeds through to higher export—and lower import—volumes.

Output in Japan in Q1 was no higher than at the end of 1991

In Japan, GDP rose by 0.1% in the first quarter—and was only 0.1% higher than a year earlier—after contracting by 1% in the final quarter of last year (the largest quarterly fall since 1973). Japan entered recession in 1992; it appeared last year that the economy was recovering modestly. But data for the final quarter and the first quarter of this year have revealed a setback to the recovery. In the first quarter, business investment grew for the third consecutive quarter, but growth in personal consumption was weak. As Chart 6 shows, apart from a short, sharp recession after the first oil price shock in 1974, the Japanese economy has not grown so slowly in the past 25 years.

Industrial production fell by more than 1% in the first two months of the second quarter, after increasing by 1.3% in the first quarter. According to the Bank of Japan's May Tankan survey, short-term corporate sentiment improved modestly between February and May, although by less than expected at the time of the previous survey. Manufacturers did not expect business conditions to improve over

the next three months. And non-manufacturers and small firms were less optimistic than major manufacturers. Optimistic firms included basic material companies, such as steel and petrochemicals firms, which have benefited from strong external demand in the rest of Asia. But the survey revealed concern about the outlook for exports, as the appreciation of the yen continued to worsen the competitiveness of Japanese exporters.

Inventories of finished goods rose by nearly 2% in the first quarter compared with the previous quarter. This may have partly reflected temporary factors, such as a disruption to distribution following the earthquake and the 'window dressing' of balance sheets before the end of the fiscal year. But stocks rose further in April and May while production fell, suggesting that consumption was lower than expected, perhaps partly because of the Kobe earthquake and recent terrorist attacks. Uncertainty over job prospects—in April, unemployment rose to its highest level since the Second World War—and the impact of the large fall in the Japanese stock market in the first six months of the year will have also affected spending. The appreciation of the yen is reducing import prices, however. Provided these falls are reflected in prices paid by the consumer—and not absorbed within wider margins in the distributive sector—they should boost consumption.

The Japanese banking sector has been affected by the weakness of the economy since 1991 and, in particular, by the large falls in property and land prices. The fall in Japanese equity prices in the first half of this year affected banks' capital adequacy ratios, since many banks count unrealised gains on shareholdings as capital. But in March, the ratios for the major 21 banks remained above the 8% set by the Basle Accord in 1988, and the sharp rise in equity prices in the first two weeks of July will have reduced pressure on them. When the recovery strengthens, however, the banks might find it hard to meet all of the demand for credit without jeopardising their capital ratios, if Japanese share prices were to start falling again. The government has announced the start of a study into ways of dealing with troubled financial institutions, including the possible use of public funds.

The Economic Planning Agency's report for June noted that the economy remained on a gradual recovery path, but that a weak tone had emerged in some sectors, particularly the personal sector. As reconstruction following the earthquake begins, domestic demand will probably receive a boost in the second half of the year. Despite slow domestic demand growth, net exports fell by nearly ¥2 trillion between the second quarter of last year and the first quarter of this, probably reflecting past appreciation of the yen. Given its further appreciation in the first half of the year, net exports may continue to reduce GDP growth over the rest of this year, particularly if reconstruction materials are imported.

European consumption growth remained weak, but investment has been recovering more quickly

In France, GDP grew by 0.7% in the first quarter and the estimate of growth in 1994 was revised up to 2.8%. Table B shows that net trade made a significant positive contribution to growth in the final quarter of 1994 and in the first quarter of this year, but that consumption growth remained low. As noted in the May *Bulletin*, consumption in France and Germany has not recovered as quickly as in the United States or the United Kingdom during this recovery.

Table B
Contributions to French GDP growth

Percentage points (a)

	1993	1994		1995
	Year	Year	Q4	Q1
Consumption	0.1	0.9	—	0.2
Total investment	-1.3	0.3	0.2	0.3
Government expenditure	0.6	0.2	0.1	0.2
Stockbuilding	-1.8	1.6	0.3	-0.4
Domestic demand	**-2.3**	**3.0**	**0.5**	**0.3**
Net external trade	0.8	-0.2	0.2	0.4
GDP	**-1.5**	**2.8**	**0.8**	**0.7**

(a) Quarterly contributions are relative to the previous quarter. Components may not sum to total because of rounding.

Employment grew by only 113,000 (½% of the labour force) in the first two years of the French recovery, so it is perhaps not surprising that consumption growth was weak. Recently, uncertainty over the result of the presidential election in the second quarter may also have restrained spending temporarily. French business investment was 6.4% higher in the first quarter than a year earlier and the French statistical agency has projected continued strong rises throughout the rest of 1995.

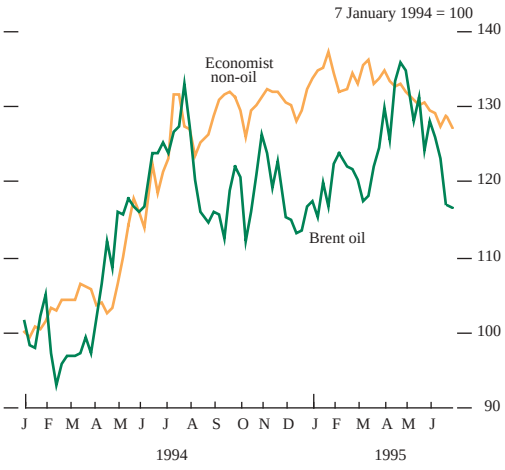
Analysis of activity in Germany since the start of the year has been difficult because many of the monthly series have been reweighted to adopt EU classifications. The box on page 236 examines the available indicators and considers what survey data reveal about activity. Consumption may have been affected by tax increases at the start of year, if these were not fully anticipated. Although higher-than-expected wage settlements in the first quarter may boost workers' disposable incomes this year and next, employment creation will probably be curtailed. In its June report, the Bundesbank said that the combination of sharp wage increases and the appreciation of the Deutsche Mark had resulted in a considerable burden on enterprises and that, although a cyclical slump is not to be expected, a slowing of growth is.

GDP rose by 1.5% in Italy in the first quarter and was 4% higher than a year earlier. Domestic demand was lower than in the previous quarter, but net exports increased significantly—contributing 1.8 percentage points to first-quarter GDP growth. Spanish GDP rose by 1% in the first quarter and was 3.1% higher than a year earlier. In both countries, private consumption growth was weak in the first quarter. The corporate sector has been more buoyant in both countries so far during this recovery, because of significant improvements in competitiveness since 1992. Although manufacturing production increased quickly last year, employment in that sector fell in both Italy and Spain.

Non-oil commodity prices fell in the second quarter

Non-oil commodity prices, as measured by the Economist dollar-denominated index, were on average 2½% lower in the second quarter than in the first, although the fall between March and June was much larger (nearly 4½%). All three of the sub-indices—for food, metals and non-food agriculturals—fell. But as Chart 7 shows, non-oil prices remained some 30% higher than at the start of 1994. Brent crude oil prices rose to over $19 a barrel towards the end of April, but by June had fallen back to just over $17 a barrel.

Chart 7
Commodity prices(a)



(a) In dollars.

Because of exchange rate movements, the fall in commodity prices since the first quarter was even larger for countries whose currencies have appreciated against the dollar, particularly Japan and Germany. This may put upward pressure on dollar-denominated prices if it leads to increased demand for commodities outside the United States. The fall in dollar prices may reflect lower-than-expected industrial demand: industrial production fell in North America and the United Kingdom between January and May. In continental Europe, the picture was less clear but industrial production growth appeared to be slowing.

Producer price inflation continued to rise in most countries

Falls in commodity prices should help to relieve upward pressure on producer prices. In the United States, producer output price

Activity in Germany

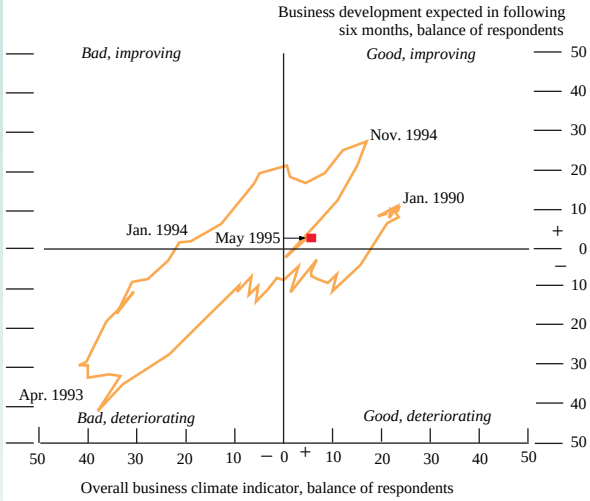
Data on activity in Germany this year have been delayed by the change-over to a new industrial classification—based on European standards—for reporting production and new orders. As well as delaying the publication of data, the reforms have meant that the series have been volatile and that direct comparisons with previous releases have not been possible. First-quarter GDP data will not be published until September, and even then comparisons with earlier data will be complicated by a new reporting structure: for the first time, demand components will only be published for the whole of Germany.

At the same time, a number of recent developments have raised uncertainty about the outlook for the German economy: notably, the sharp appreciation of the Deutsche Mark this year and higher-than-expected wage settlements. This box examines the state of the economy in the light of these different developments.

The appreciation of the Deutsche Mark so far this year will reduce German export growth, which has already been affected by slower demand growth in the first quarter in a number of European economies. Survey evidence, including that compiled by the Munich-based Ifo Institute of Economic Research, suggests firms have deferred planned increases in production in response both to expectations of weakening exports and larger than desired stocks. And although capacity utilisation rose in the first quarter and the length of order books was unchanged, it is likely that production growth rates were levelling off. The chart summarises recent trends: it plots the manufacturing business climate index—a measure of current trading conditions—against the expected business development index. It suggests that conditions in May remained good and improving, but that firms were less optimistic about the current climate—and future prospects—than they had been six months earlier.

In June, indices of leading industrial share prices were lower than in January, as discounted dividends declined with the worsening of external trading conditions and the uncertain performance of the domestic economy. Largely as a result of falling market interest rates, lending to domestic non-banks continued to rise in the first few months of the year, but less quickly than in the second half of 1994.

The Ifo business cycle



Labour market conditions are affected by changes in corporate profitability. In Germany as a whole, conditions began to improve in the first few months of this year after a prolonged period of weakness. Unemployment fell to 9.0% in May—its lowest level since September 1993—and employment growth resumed in February and March. Nonetheless, western German manufacturing employment continued to fall and remained the major source of weakness in the labour market. Higher-than-expected wage settlements are likely to increase German firms' incentives for capital investment and for the transfer of production abroad. Employment creation is likely to be reduced.

In the second half of the year, consumption growth may rise. Tax increases in January reduced real disposable incomes by around 1.5%. But compensating wage settlements have boosted employment incomes, and income expectations have been supported by anticipated tax cuts in 1996, despite continuing uncertainty about employment prospects. In other sectors, surveys of firms' investment intentions have suggested that business fixed investment will be more buoyant than consumption in the immediate future. But growth in the construction sector may fall, now that fiscal incentives and subsidies have expired. In eastern Germany, most forecasters expect GDP growth of around 9% this year, and the German government's forecast for all-German growth is 3%. The balance of growth is likely to shift further towards the domestic economy over the next few quarters.

Chart 8
Producer prices

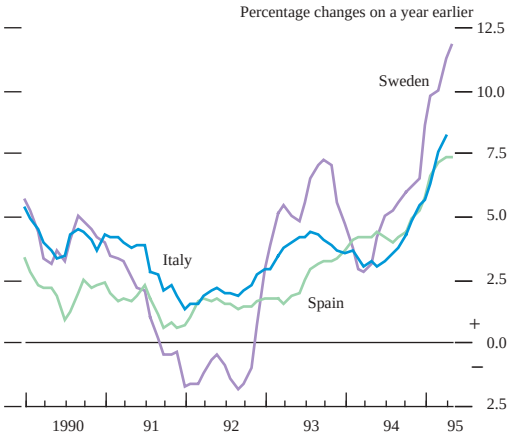
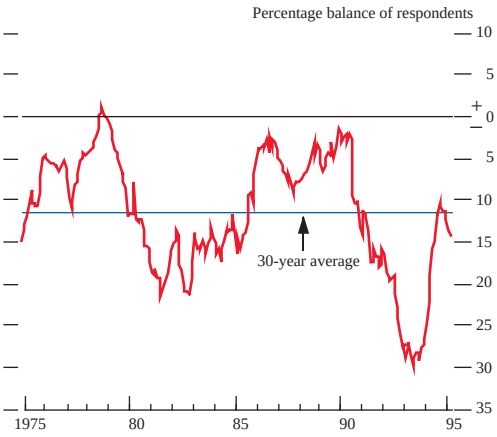


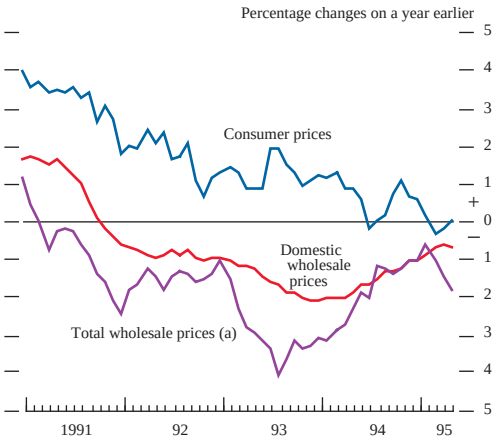
Chart 9
European consumer confidence(a)



Source: European Commission.

(a) A GDP-weighted average of France, Italy and western Germany.

Chart 10
Japanese prices



(a) Includes import and export prices.

inflation has remained low; it was around 2% in the year to June, even though intermediate goods price inflation was nearly 7% in the same period. Import prices, in dollar terms, were 6.7% higher in May than a year earlier, but because import penetration in the United States is low by international standards, the feed-through to total costs will be less than elsewhere. Average hourly earnings for non-farm employees were 3.1% higher in June than a year earlier.

As Chart 8 shows, in Italy, Spain and Sweden producer price inflation has risen since the middle of last year. This probably reflects past exchange rate depreciation. As well as increasing import costs, lower real exchange rates have allowed exporters in these countries to increase sales volumes significantly; and though the recovery in internal demand is fairly recent, capacity constraints may be appearing in export sectors. In each case, growth in capacity will have been curtailed by very large falls in investment during the recessions.

Since the start of the year, consumer price inflation has fallen in Germany and Japan, but risen in most other major economies

Different trends in consumer price inflation emerged in the major economies in the first half of the year. In Germany, France and Japan, annual consumer price inflation fell or remained unchanged between December and May. In Canada, Italy and Spain, it rose rapidly. In the United States and the United Kingdom it also rose, but by less. Of these countries, however, only Italy and Spain had annual consumer price inflation of more than 4% in April.

In the United States, despite continuing low producer price inflation annual consumer price inflation edged higher—to 2.9% in June—after reaching a trough of 2.4% during 1994. US retailers may have responded to the strength of domestic consumption by widening margins—this would be consistent with historically high corporate earnings. If so, the apparent weakening of consumption in the second quarter may prompt firms to narrow their margins to stimulate sales.

In France and Germany, consumer price inflation fell slightly between February and May. Consumer demand has remained weak, and the effective exchange rate appreciations in the first half have reduced import prices. Chart 9 shows that although consumer confidence in the major continental European economies recovered to its long-term average at the end of 1994, it fell by three percentage points between December and April. In such an environment, retailers may be reluctant to increase prices for fear of losing sales volumes. Despite this, the cost of living in Germany rose more than expected in June and annual inflation increased slightly. Although the prices of food and goods rose only slowly in the year to June, the prices of services and rents were 3.6% higher than a year earlier. Increases in consumer price inflation in Italy and Spain in the first months of the year reflected higher producer and import price inflation, and the effect of indirect tax increases.

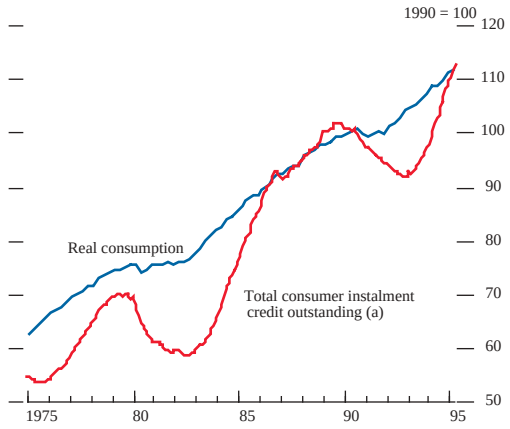
Inflationary pressures in Japan have been very low. Indeed, some price indices have been falling: annual consumer price inflation was negative in March and April, and flat in May—as Chart 10 shows. And measured price indices may not be capturing widespread discounting, and so understating the real extent of deflation (and also understating retail sales volumes). Domestic wholesale price

deflation has been gradually diminishing since the beginning of 1994, but prices have remained lower than a year earlier. Total wholesale prices, which include traded goods prices, have been falling more rapidly since the start of the year. Import and export prices fell by around 7%–8% in the first five months, largely as a result of the appreciation of the yen. The effect of cheaper imports has also fed through directly to consumer prices, since some imports are of finished goods. Lower prices will help stimulate consumption, particularly if domestic prices are reduced to compete with cheaper imports.

Narrow money growth remained weak in a number of countries

In the United States, the stock of narrow money (M1) fell during the first two months of the second quarter: by May, it was unchanged on a year earlier. Annual broad money (M3) growth rose in the first quarter, and continued to rise in April and May. And consumer instalment credit grew by over 4% in the first five months (in real purchasing terms). Chart 11 shows that consumer credit has tended to be more volatile than consumption since 1975, and in the two previous cycles fell *before* consumption did. So the continuation of strong credit growth would suggest that consumption is unlikely to have slowed significantly in the second quarter.

Chart 11
United States: consumer instalment credit and consumption



(a) Deflated by the consumer price index.

M1 in Germany rose by only 0.2% in the first quarter, and M3 fell by over 1¼%. The extended measure of M3—which includes money-market funds, and deposits with foreign subsidiaries and branches of German banks—fell by nearly ¾%. But in the second quarter, M3 rose by 1.1% according to preliminary data. Even if German M3 were to grow at nearly 0.8% a month for the rest of this year, the Bundesbank's target range (of growth of 4%–6% between the fourth quarters of 1994 and this year) would still be undershot. In France, M1 fell in the first quarter; in Italy, it was unchanged.

Japanese narrow money growth has recently been very erratic, probably as a consequence of the earthquake, but generally has been growing strongly since the start of the year: by May, M1 was more than 6½% higher than at the end of last year. Broad money has been less volatile—annual growth had been increasing slowly since the start of 1993, but fell slightly in the first two months of the second quarter.

European official interest rates have diverged, and early in the third quarter the US federal funds rate was increased

As reported in the May *Bulletin*, official interest rates were cut in Germany and Japan at the start of the second quarter. A number of other European countries followed the German interest rate cut, as the turbulence in the ERM diminished in the second quarter. The Bank of France reintroduced its 5–10 day repurchase rate, and cut it by 25 basis points at the end of June and a further 25 basis points early in the third quarter as the differential between short-term market rates in France and Germany fell. The reductions in official rates followed the new government's mini-budget, which maintained the aim of reducing the fiscal deficit to 3% of GDP in 1997.

Interest rates were raised in Finland, Italy, Spain and Sweden during the second quarter. In each case, annual producer price inflation had been rising since the start of the year. And consumer price inflation rose over the same period in all except Finland. In Italy,

Table C
Three-month interest rates expected in December 1995[a]

Per cent

	30 December 1994	31 March 1995	30 June 1995
US dollar	8.5	7.1	5.7
Deutsche Mark	6.7	5.3	4.7
Yen	3.1	1.8	0.9
Sterling	8.9	8.0	7.5

(a) Expected rates as implied by futures contracts.

Chart 12
Effective exchange rates

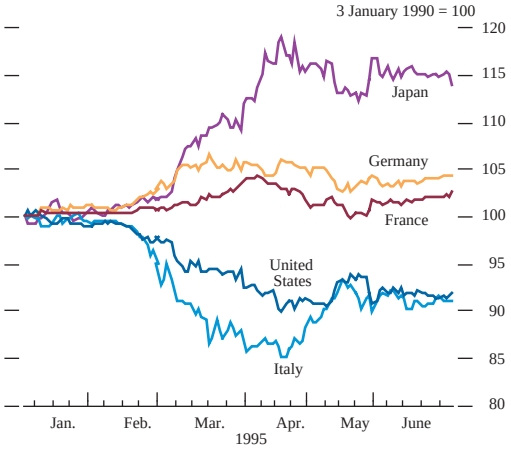


Table D
General government structural balances[a]

	1993	1994	Projections 1995	1996
Canada	-4.1	-3.4	-2.7	-1.7
France	-3.8	-3.9	-3.4	-3.0
Germany	-2.7	-1.9	-1.8	-1.7
Italy	-7.9	-7.4	-6.7	-6.1
Japan	-1.6	-2.9	-2.8	-2.8
United States	-3.2	-2.4	-2.5	-2.6
Memo:				
United Kingdom	-5.6	-4.8	-3.0	-1.7

Source: OECD June 1995 *Economic Outlook.*

(a) Structural balances estimate the general government balance assuming that the economy is producing at full potential.

Spain and Sweden, the interest rate increases continued a period of monetary policy tightening started in the second half of last year.

As Table C and Chart 3 show, the level of US interest rates expected at the end of 1995 fell during the first half of the year: by the end of the period, futures prices implied that the next move in US interest rates could be down. By contrast, at the start of the year, three-month US interest rates were expected to rise by 250 basis points by June (there was an actual rise of only 50 basis points), and by a further 50 basis points by December. The changes in expectations occurred despite rises in annual consumer price inflation in the United States, but probably reflected the 'news' about the slowdown in activity there. Early in the third quarter, the US federal funds rate was reduced by 25 basis points to 5.75%, following a total increase of three percentage points since the start of 1994.

Expected levels of interest rates also fell in Germany and Japan. At the end of the second quarter, German short-term interest rates were expected to remain unchanged throughout the rest of the year, and futures prices implied that interest rates in Japan might fall before the year-end. Early in the third quarter, the Bank of Japan allowed market interest rates to fall below the Official Discount Rate.

Nominal effective exchange rates in the major economies were less volatile in the second quarter than in the first, and measured in this way most G7 currencies were broadly unchanged between the end of the first and second quarters. But the yen's nominal effective exchange rate appreciated by about 2½% during the second quarter and the lira's by nearly 4½% (see Chart 12). By the end of the quarter, the lira remained significantly lower against a basket of currencies than at the start of the year.

Fiscal deficits remained high in a number of countries, but are projected to fall

General government deficits remained high in a number of countries last year, but fiscal policy is being tightened in most European countries. Government *structural* balances are not affected by cyclical improvements in, for example, unemployment benefits. Therefore, changes in structural balances show the direction of fiscal policy more clearly than actual government balances. Table D shows that, according to the OECD's latest forecast, structural balances will fall in the major European economies and in Canada this year and next.

The new French government's 'mini-budget'—announced in June—aimed at reducing unemployment and stimulating consumption and the housing sector, while reducing the general government deficit from 6% of GDP last year to around 5% this, through tax increases and spending cuts elsewhere. The government still aims to reduce the fiscal deficit to 3% of GDP in 1997, to meet the Maastricht convergence criterion.

The Japanese government announced a supplementary budget in the second quarter, as well as a stimulus package. The former, mainly aimed at earthquake reconstruction, was approved in May. The latter brought forward spending of the public works budget into the first half of the fiscal year, without allocating new money. But a further supplementary budget is likely in the second half of the year, and income tax cuts may be repeated next year.

Financial market developments

- *Confidence among investors and issuers appeared to recover quickly in the second quarter after the turbulent conditions earlier in the year, and risk premia fell on a range of higher-risk assets. Nevertheless, trading and issuing activity remained muted compared with early 1994.*

- *Activity in derivatives markets was subdued, in part reflecting the more stable conditions in underlying cash markets and in part end-users' continuing reaction to a number of highly visible losses in derivatives markets in recent quarters.*

- *Issue levels in both bond and equity markets remained low compared with early 1994; but early indications suggest that volumes have been rising—and maturities lengthening—since the start of the year.*

Overview

Overall, conditions in international markets were relatively stable in the second quarter, strengthening the view that market confidence had recovered fairly quickly from the uncertainty caused by the Mexican crisis and the currency turbulence earlier in the year. Prices rallied in most main financial-asset markets during the quarter. Yields in the major overseas sovereign debt markets continued to fall and spreads on a range of riskier assets—such as corporate debt, higher-yielding OECD sovereign debt and emerging-market debt—narrowed over comparable core assets, returning them to around the levels of late 1994. Prices in the main equity markets also rose, except in Japan and France.

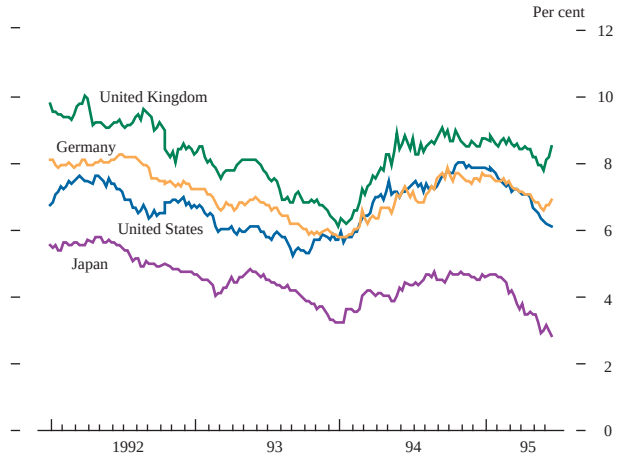
Trends in derivatives markets reflected the more stable conditions in the underlying markets: the volatilities implied by the prices of a number of exchange-traded options fell and turnover on the world's major derivatives exchanges was down on the record levels seen last year, reflecting lower demand for hedging and speculative purposes. A number of well-publicised losses in derivatives markets also continued to depress demand for derivatives products—particularly more complex over-the-counter (OTC) derivatives.

There was a modest increase in international primary bond issues compared with the first quarter of the year, but volumes in both bond and equity markets remained subdued compared with those in the first quarter of 1994. The average maturity of new bond issues also rose quite sharply compared with the first quarter of this year.

Bond and other debt markets

Yields in the main overseas bond markets fell over the quarter (see Chart 1). The yield on ten-year US Treasuries fell from 7.20% to 6.21%, and the dollar yield curve shifted downwards and flattened in maturities up to five years. This mainly reflected the growing view among investors that the outlook for US output was weaker than had previously been thought. Technical factors—such as the hedging of changes in the duration of pools of mortgages(1)—were also reported to have increased demand for longer-maturity Treasuries.

Chart 1
Ten-year government bond yields



Source: Bloomberg.

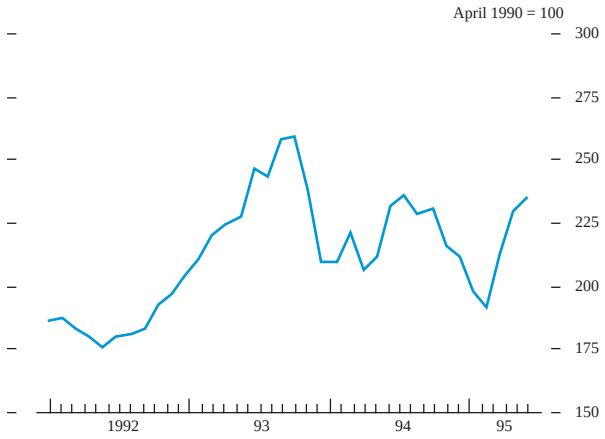
Price rises in the US Treasury market were mirrored in other major markets for much of the period: ten-year Japanese government bond yields fell to 2.74% at the end of June—some 190 basis points lower than at the start of January—and yields on ten-year German government bonds (Bunds) dropped from 7.19% at the end of March to 6.94% by the end of the quarter.

(1) Duration is defined as the average maturity of all future payments on a security, weighted according to the present value of each payment. US mortgage-holders often choose to prepay fixed-rate mortgages when interest rates fall, so that they can refinance their debt without penalty. As a result, the average maturity of pools of mortgages falls.

The yields on a number of other securities tightened relative to comparable major sovereign bond markets. First, the spreads between Bunds and several other European government bonds narrowed: differentials with Italian, Swedish and Spanish ten-year bonds tightened by 50, 30 and 30 basis points respectively, and yields spreads ended the period close to the levels seen in late 1994.

Second, the price of dollar-denominated emerging-market debt rose sharply, after reaching a trough in March, and returned to the levels prevailing before the Mexican crisis in December. The Salomon Brothers Brady Bond index rose by 22% over the period; by the end of June it was some 14% higher than a year earlier (see Chart 2). The rapid recovery

Chart 2
Recent Brady Bond performance



Source: Salomon Brothers Brady Bond index.

in these markets reflected the positive effect of lower US interest rates, the release of generally positive economic data for several of the major developing countries and the perceived resilience of other developing economies to events in Mexico. Brazilian Brady bonds, for example, rose by 24% in the year to end-June, whereas Mexican Brady bonds rose by only 2%. The success of the international support operation probably reduced the consequences of the crisis on Mexican debt.

Third, in a number of markets the spreads faced by corporate borrowers fell. In dollar bond markets, the spread between a basket of ten-year bonds issued by AAA-rated companies and a comparable US Treasury fell from some 40–45 basis points—a level similar to that seen for most of the second half of 1994—to just over 35 basis points by the end of June. The spread for a similar basket of lower-rated companies fell somewhat more, by about 15 basis points to around 75 basis points by the end of June. However, there was no equivalent reduction in the spreads on either euro-Deutsche Mark or euroyen issues over comparable German and Japanese government bonds; they remained at around 30 basis points and 20 basis points respectively for baskets of bonds issued by AAA-rated corporates. Market participants reported, however, that the very low nominal yields on Japanese government bonds appeared to be leading some Japanese investors to take on more credit risk in order to earn higher nominal returns.

International issues

Partly reflecting the improved trading conditions in secondary markets, the value of gross bond issues in the international markets recovered a little in the second quarter—rising by almost $6 billion to $104 billion. In spite of this, issues remained at relatively low levels compared with the first quarter of 1994 (see Table A). The upturn in the second quarter occurred despite only a small rise in the volume of fixed-rate issues, which rose 1% to $82.7 billion. The increase in gross floating-rate issues was more significant: issues rose by 17% over the preceding quarter to $16.6 billion. But, despite doubling to $4.6 billion, equity-related issues remained low by historic standards, largely because of the subdued conditions on Japanese equity markets.

Table A
Total financing activity:[a] international markets by sector

$ billions; by announcement date

	1994				1995	
	Q1	Q2	Q3	Q4	Q1	Q2
International bond issues						
Straights	77.1	68.6	75.0	75.6	81.7	82.7
Equity-related	20.7	5.7	4.0	2.8	2.3	4.6
of which:						
Warrants	*8.2*	*0.8*	*0.7*	*1.1*	*0.9*	*0.5*
Convertibles	*12.5*	*4.9*	*3.3*	*1.7*	*1.4*	*4.1*
Floating-rate notes	38.7	17.8	17.9	18.3	14.2	16.6
Bonds with non-equity warrants	0.5	—	—	—	—	—
Total	**136.5**	**92.1**	**96.9**	**96.7**	**98.2**	**103.9**
Credit facilities (announcements)						
Euronote facilities	35.7	46.0	40.2	71.4	54.9	62.8
of which:						
CP	*3.9*	*15.4*	*10.9*	*6.2*	*6.8*	*8.9*
MTNs	*31.9*	*30.6*	*29.3*	*65.2*	*48.1*	*53.9*
NIFs/RUFs	—	—	—	—	—	—
Syndicated credits	53.8	64.5	59.3	72.8	101.6	74.9
Total	**89.5**	**110.5**	**99.9**	**145.8**	**156.5**	**137.7**
Memo: amounts outstanding						
All international						
Bonds [b]	1,888.4	1,947.7	2,020.8	2,041.8	2,188.5	2,232.8
Euronotes [c]	289.8	330.3	378.7	406.1	461.6	517.1
of which, EMTNs	*177.9*	*216.5*	*259.4*	*292.0*	*347.1*	*397.5*

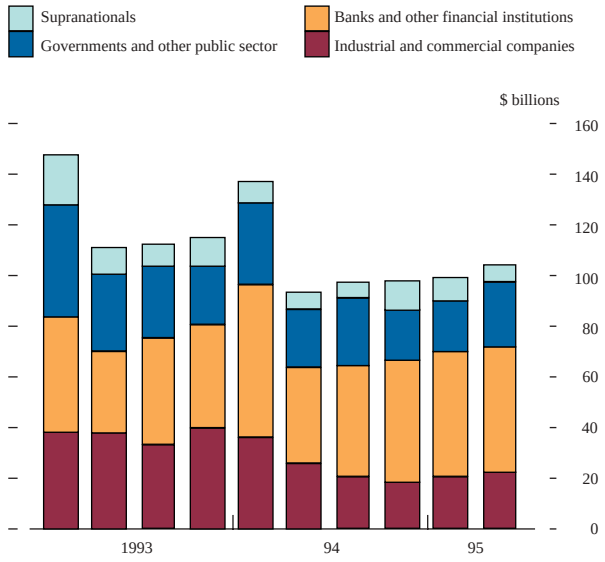
(a) Maturities of one year and over. The table includes euro and foreign issues and publicised placements. Issues which repackage existing bond issues are not included. Figures may not add to totals because of rounding. Bond total includes issues from MTN programmes.
(b) BIS-adjusted figures, including currency adjustment. Includes issues of fixed-rate bonds and floating-rate notes.
(c) Euroclear figures.

The average maturity of new bond issues rose for all currencies except the yen and Ecu, reflecting the relatively buoyant issuing conditions. The average maturity of dollar bonds rose to 8.4 years compared with 5.9 years in the first three months of 1995. The rise in the average maturities of Deutsche Mark bonds was more modest, from 5.4 to 6.2 years. The general fall in yields meant that the average duration of new issues increased still more.

Narrower yield spreads prompted fairly large increases in issues in some of the higher-risk markets: for example, the

value of corporate bonds issued in international markets rose by 12% in the second quarter to $21.4 billion (see Chart 3), though they remained well below the $35 billion raised in the first quarter of 1994.

Chart 3
Borrowers in the international bond market



Source: Bank of England ICMS database.

Similarly, the rapid—if fragile—return of investor confidence in emerging markets permitted a rise in the volume of issues by Latin American and Caribbean borrowers, from $0.2 billion in the first quarter to $3.9 billion. The Brazilian government issued a yen eurobond worth ¥80 billion ($960 million) in late May, the first for some 15 years; and Bancomext, the state-owned Mexican foreign trade bank, issued a $300 million floating-rate note in the middle of June. Latin American borrowers were able to return to the capital markets relatively swiftly because the fall-out expected by investors in the immediate aftermath of the Mexico crisis did not materialise: other emerging nations were not forced by the crisis to change their own macroeconomic policies significantly, and the success of the international support operation reduced the immediate consequences of the crisis for Mexico itself.

Despite the gradual upturn in the value of bond issues, borrowing in other forms continued to grow in importance

Table B
Currency composition of international bond issues

$ billions

Currency denomination	1993	1994				1995	
	Year	Year	Q2	Q3	Q4	Q1	Q2
US dollar	175.6	147.3	26.2	30.6	37.3	30.6	32.8
Yen	58.7	77.8	20.7	23.9	22.1	13.6	25.4
Deutsche Mark	56.4	39.8	8.4	8.5	9.2	14.3	20.1
Sterling	42.6	29.5	6.6	5.3	4.1	6.5	4.5
French franc	42.3	28.7	8.5	3.1	3.5	4.8	3.2
Swiss franc	27.5	20.8	3.2	6.2	4.3	5.7	6.8
Italian lira	12.3	17.1	5.0	4.6	2.7	5.9	1.7
Ecu	11.4	7.6	1.8	1.5	0.9	2.9	0.2
Other	58.2	53.3	11.6	13.2	12.3	14.0	9.2
Total	**485.0**	**421.9**	**92.0**	**96.9**	**96.4**	**98.2**	**103.9**

Source: Bank of England ICMS database.

Table C
Value of gross bond issues in domestic markets

$ billions

	1994				1995	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	339.0	297.1	279.3	234.6	323.2	. .
of which, private sector	*149.9*	*126.4*	*100.7*	*97.9*	*120.5*	. .
Japan	289.4	285.5	279.4	306.8	. .	. .
of which, private sector	*89.1*	*107.2*	*124.9*	*115.5*	. .	. .
Germany	94.5	73.0	98.2	119.1	104.6	. .
of which, private sector	*63.9*	*54.3*	*63.1*	*71.3*	*74.9*	. .
France	22.5	15.3	15.3	19.2	18.0	. .
of which, private sector	*6.8*	*4.6*	*3.2*	*5.3*	*5.4*	. .
United Kingdom (£ billions)	8.9	7.8	7.5	8.2	7.3	6.1
of which, private sector	*0.8*	*0.2*	*0.5*	*0.1*	*0.2*	*0.3*

. . not available.

Sources: Bank of England, OECD June 1995 *Financial Statistics Monthly* and IMF May 1995 *International Financial Statistics.*

during the second quarter. Gross issues of euromedium-term notes (EMTNs), for example, rose to $53.9 billion, some 76% up on a year earlier, continuing a general upward trend. Many eurobonds are now in effect issued as EMTNs—which are simply debt securities issued under a continuous programme, with maturities from under one year to over twenty. Once a borrower has set up a programme, issuing is simple and normally costs less than a bond. Similarly, the value of international syndicated credit lending announced in the second quarter remained high at $74.9 billion (some 16% higher than a year earlier) as continuing strong competition between banks in this sector ensured that spreads remained low and that issuers could raise funds more cheaply in that form.

Sterling issues

Announcements of new sterling bond issues totalled £3.3 billion ($5.4 billion) in the second quarter, a fall of £900 million from the first three months of the year. Some £650 million of these were floating-rate issues. £372 million of the total fixed-interest issues were domestic bonds, including a £73 million issue for seven local authorities, a £49 million convertible issue and a £100 million fixed-rate preference share issue. The rest were in eurosterling, taking sterling's share of international issues to 4.5%. £1.8 billion of the quarter's £2.4 billion fixed-rate eurosterling issues were by UK non-financial companies; a number of companies made issues to meet expected demand for bonds that could be included in corporate-bond personal equity plans (PEPs) after July (see below). Glaxo Wellcome launched a £500 million ten-year eurobond to refinance the bank borrowing taken on at the time of Glaxo's purchase of Wellcome. This and the European Investment Bank's £500 million issue in January were the largest sterling issues since February 1994. Outstanding sterling commercial paper rose to £6.1 billion over the quarter from £5.9 billion at the end of March. Outstanding sterling issues from MTN programmes also rose, to £14.0 billion from £12.8 billion at the end of the first quarter.

Two announcements by the Inland Revenue affected the sterling bond markets significantly during the quarter. On 31 March, the Revenue produced draft proposals for consultation on widening the range of instruments eligible in PEPs to include certain corporate bonds, preference shares

and convertibles. These proposed that fixed-rate corporate bond issues by UK non-financial companies with a minimum term to redemption of five years at the time of acquisition would be eligible for both direct investment in PEPs and via qualifying unit and investment trusts. The proposal prompted a significant tightening of spreads in the corporate sector, beyond that which followed the initial announcement of the proposal in the Budget. Five to ten-year maturities tightened markedly, because managers of potential PEP trusts are likely to favour this sector in order to keep the duration of portfolios relatively low; high-yielding issues were also in demand, because these products are likely to be promoted on the basis of high income for retail investors. The tightening also spread to longer maturities given the potential extent of PEP demand.

The admission to PEPs of such instruments has two benefits: it will increase the availability and range of borrowing opportunities for UK companies, particularly those medium-sized companies which have traditionally relied on bank finance or development capital; and it will also increase the choice of tax-free instruments for investors.

In May, the Revenue produced a consultative document proposing changes to the taxation of gilts and other bonds. This suggested replacing the current distinction between income and capital gain with a unified treatment. Under the proposals, income and capital gains on gilts and bonds would be taxable or deductible from tax as income, removing the current exemption from tax of capital gains, but capital losses would be allowable against tax. Following the announcement of the proposals, yields on high and low-coupon gilts and other sterling bonds converged markedly. (In early July, following the consultation, the Revenue announced its decisions on the proposals: the box on page 228 gives details.)

The reforms will involve a major simplification of the tax code. They will also have a number of other advantages: they will facilitate innovation in the gilt and other bond markets (including gilt strips); they will make tax a more neutral factor in investment decisions and therefore increase market efficiency; in addition, by allowing the recognition of losses, they may make it cheaper for riskier ventures to raise loan finance.

In addition, some of the changes included in the current Pensions Bill are likely to have a structural impact on bond markets. The Bill builds on a number of the recommendations of the Pension Law Review Committee, chaired by Professor Goode, which was commissioned by the Secretary of State for Social Security in 1992 and reported in September 1993 on the regulation of occupational pension schemes. It includes a statutory Minimum Funding Requirement (MFR) for defined benefit occupational schemes and a requirement to increase future pensions in line with the lower of RPI and 5%, known as Limited Price Indexation (LPI). A number of commentators consider that the introduction of the MFR, particularly at a time when pension funds are becoming increasingly mature, will lead to an increase in the demand for gilts and, potentially, for non-government bonds.

Ecu issues

In the United Kingdom, there were regular monthly auctions of ECU 1 billion of Ecu Treasury bills during the second quarter, comprising ECU 200 million of one-month, ECU 500 million of three-month and ECU 300 million of six-month bills. The auctions continued to be oversubscribed, with issues being covered by an average of 2.3 times the amount on offer. Bids were accepted at yields up to 12 basis points below the Ecu Libid rate of the appropriate maturity, somewhat narrower than in the previous quarter but within the range achieved since the Ecu market disturbance in 1992. There are currently ECU 3.5 billion of Treasury bills outstanding. Secondary market turnover averaged ECU 2.2 billion a month, down from ECU 2.8 billion in the previous quarter, but close to the average for 1994.

The Bank reopened the Ecu Treasury note maturing in 1998, with a tender for ECU 500 million on 18 April, raising the amount outstanding to ECU 1,500 million. Cover at the tender was 3.6 times the amount on offer and bids were accepted in a range of 7.38%–7.42%. The total of notes outstanding under the UK note programme rose from ECU 5.5 billion to ECU 6 billion. Stimulated by the issue of the 1998 note, turnover in the notes was at record levels in the first half of 1995. The UK government's total outstanding Ecu debt rose from ECU 11.5 billion to ECU 12.0 billion over the quarter.

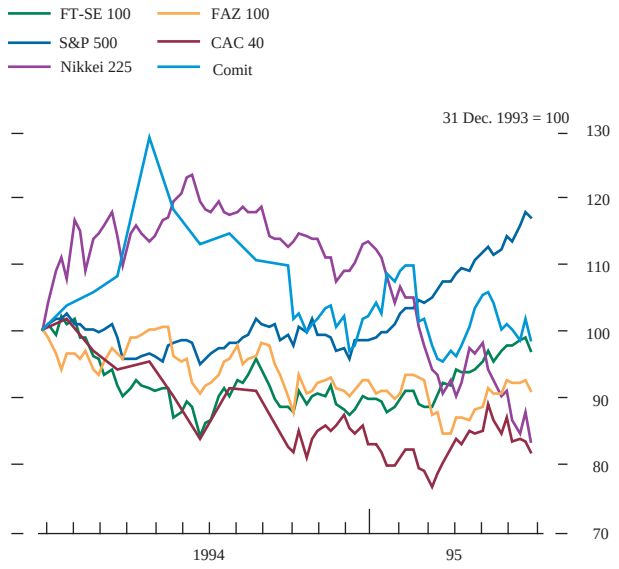
The French government issued ECU 700 million in bonds and notes during the quarter, taking its outstanding Ecu debt to ECU 23.9 billion. The Italian government issued ECU 1.0 billion of notes in May, but because of redemptions the total outstanding fell from ECU 25.6 billion to ECU 24.9 billion over the quarter. In addition, the amount of Italian government eurobonds outstanding remained at ECU 5.9 billion.

Equity markets

Equity prices in major international markets—with the exceptions of Japan and France—rose over the period (see Chart 4), driven largely by the same macroeconomic factors that affected bond markets. In the United States, equity prices continued the strong rise seen in the first quarter: the Standard and Poor's 500 index rose by 8.8% between April and June. Like bond markets, equity prices responded favourably to economic data indicating that the economy was slowing. Strong earnings figures from listed companies boosted prices further, although the persistent weakness of the dollar was interpreted as a negative factor.

The UK market also continued the rally begun earlier in the year, with the FT–SE 100 index rising by 5.6% in the second quarter. Despite the weakness of sterling, the market lowered its expectations of an early increase in base rates, following figures showing a slowdown in economic growth.

Chart 4
Equity indices(a)



(a) End-week prices.

Better-than-expected results from a wide cross-section of listed companies, combined with take-over announcements, also boosted equity market prices, despite uncertainty stemming from the political situation.

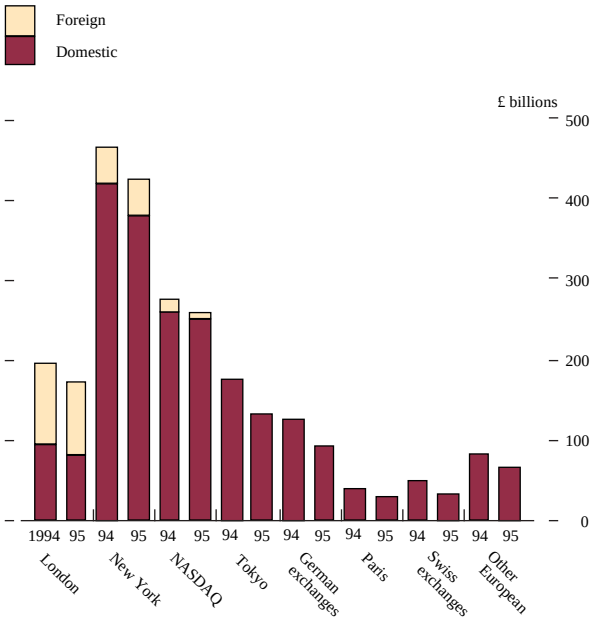
In Germany, the FAZ index rose strongly, by 7.6% during the quarter. This reflected an expected recovery in corporate profits and growing hopes of an early reduction in interest rates. In France, equity prices were buoyed by the end of the uncertainty associated with the presidential elections in May, but overall the CAC 40 index closed marginally down over the quarter. In Italy, the Comit index recorded a rise of 1.6%, as improved prospects for pension reform outweighed the effects of the rise in the discount rate announced on 26 May. In Sweden and Spain, equity markets also reflected the strong rally in domestic bond markets, rising by 12.6% and 9.2% respectively.

By contrast to the United States and Europe, Japanese equity prices fell sharply over the quarter, despite the continuing fall in longer-term Japanese interest rates. The Nikkei 225 index fell by 10% over the quarter. Equities were depressed by the poor outlook for future profits, in part because of the impact of the stronger yen and threats of trade sanctions from the United States. Prices were also affected by the perceptions of continuing fragility in the Japanese financial system, the level of bad debts held by banks and the reduction in the proportion of assets held by insurance companies in equities. The announcement in late June of a package designed to stimulate the market was unfavourably received, with the Nikkei 225 index falling 2.6% on the day.

Turnover

The most recent data show that equity market turnover in the first quarter was lower than a year earlier in all the major equity markets, reflecting the downturn in trading conditions in capital markets over the period (see Chart 5). On the New York Stock Exchange, turnover fell by 8% over the twelve months and on NASDAQ by 6%. The London Stock Exchange recorded a decline for both UK and foreign stocks, with total turnover down by 13% compared with the same period a year earlier. Volumes fell even more sharply in Germany, France and on several other European exchanges, suggesting that the recent reforms aimed at repatriating business have yet to have a significant effect. The weakness of Japanese equity prices continued to limit turnover on the

Chart 5
Turnover of domestic and foreign equities on major stock exchanges(a)



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

Tokyo Stock Exchange, which remained depressed compared with its levels in the late 1980s, though volumes were 30% higher in the first quarter than in the fourth quarter of 1994. In May, most of the top Japanese securities houses announced net losses in the year to end-March 1995, which were attributed mainly to low trading volumes. Data are not available for the second quarter of 1995, but are expected to show a pick-up in volumes in most markets as a result of improved trading conditions.

Equity issues

Like international bond markets, issues of international equities—offers of equities with an international tranche—remained subdued, at $6.9 billion in the first four months of 1995 compared with around $16.7 billion in the first four months of the previous year. This partly reflected the difficulty of bringing issues by companies from developing countries. There were only $1.3 billion of such issues in the first four months, compared with $3.2 billion for the same period last year. It also reflected a slowdown in the flow of privatisation stocks on to international equity markets. But the $1.6 billion privatisation of Repsol, the Spanish oil and gas company, was successfully completed at the beginning of the quarter, at a time when difficult market conditions resulted in other international offers being reduced in size and price. The Spanish government also sold a $130 million stake in Ence, the pulp and paper manufacturer.

Regulation of the UK equity markets

In June, the Securities and Investments Board (SIB) published a report on the structure of equity markets in the United Kingdom. The report was the culmination of a process started by the SIB's discussion paper, 'Regulation of the UK Equity Markets' (the so-called 'Agnew Report', issued in February 1994), and also gave the SIB's response to a report published in March 1995 by the Office of Fair Trading: 'Rules of the London Stock Exchange Relating to Market Makers'. It included a number of recommendations about how the regulation of UK equity markets might be amended to improve their integrity without impeding competition and innovation.

Transparency

The report recommended that information on equity trades should be published more rapidly. Agreement has recently been reached with the Stock Exchange that from January 1996 more trade information will be subject to immediate publication. Further improvements may be made after that, provided it is clear that they will not damage the overall liquidity of London's markets.

Trading between market-makers

It was suggested in the OFT's report that the exclusive access to quotes appearing on inter-dealer broker (IDB) screens at present enjoyed by market-makers distorts competition. The SIB recognised in its report that market-makers prefer to trade with each other indirectly and anonymously, and so did not suggest that access to IDB screens should be available more widely. However, agreement has been reached with the Stock Exchange that, from January 1996, details of all trades between market-makers will be published immediately.

Price display regime

Under the Stock Exchange's present rules, a market-maker is not allowed to quote a better price for a share on any other system than it quotes on the Stock Exchange's Automated Quotation system. The SIB could see no reason for retaining this rule on investor protection grounds for prices quoted on another Recognised Investment Exchange that was subject to transparency requirements.

Extension of stock borrowing

The SIB believed that an extension of the ability to borrow stock—currently restricted to market-makers—would be in line with market demands and would aid the efficient working of a more diverse marketplace. Should the Chancellor decide to extend access to stock borrowing, the SIB will take forward the necessary regulatory preparations.

Disclosure of corporate interest

The SIB supported the disclosure of material economic interests in company shares, particularly those arising from options, and announced it would issue a consultation paper on the subject.

Market-maker privileges and obligations

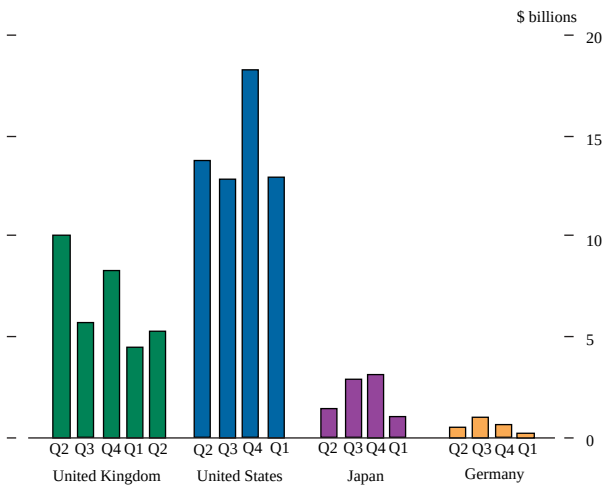
The SIB issued for consultation a draft standard on market-makers' privileges and obligations. It considered that these privileges should not extend further than is necessary to comply with market-makers' obligations.

These proposed changes are intended in part to accommodate a variety of trading platforms in the United Kingdom; the approval in June of Tradepoint Financial Networks plc as a Recognised Investment Exchange under the Financial Services Act will allow trading on a screen-based order-matching system of a selection of equities listed on the London Stock Exchange.

The most recent available data suggest that conditions in domestic equity markets were similar to those in international markets during early 1995 (see Chart 6). Issues on NASDAQ, the American Stock Exchange and the New York Stock Exchange, totalled some $13.5 billion in the first quarter, compared with $18.1 billion in the last quarter of 1994. In Japan, unfavourable secondary market conditions had a severe impact on the primary market, and the value of issues fell to just over $1 billion in the first quarter, compared with some $3.1 billion in the preceding period. Similarly, the value of issues on German exchanges slipped to around $179 million in the first quarter of 1995, compared with some $696 million in the preceding quarter.

In Germany, plans for a major overhaul of equity market structures over the next few years were announced in May. The three largest exchanges—in Frankfurt, Düsseldorf and Münich—plan to merge operations under a system that will

Chart 6
Equity capital raised in major stock exchanges



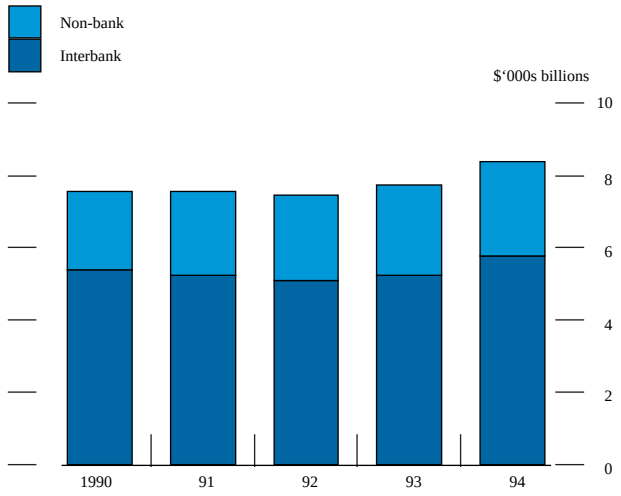
Developments in international banking in 1994

This box summarises developments in international banking in 1994: the first section looks at global trends, as revealed by quarterly statistics published by the Bank for International Settlements (BIS); the second focuses on developments in the London market, using the Bank's own data.

Banking business within the BIS reporting area[1]

International lending by banks in the BIS reporting area rose again in 1994, by $263 billion[2] (3%) to an outstanding stock of $8,373 billion[3] (see Chart A). Lending between banks accounted for $5,793 billion (69%), an increase of $289 billion (5%) compared with 1993. In contrast to the previous year's rise, lending to non-bank end-users fell by $26 billion (1%), which resulted in a small fall in its share of the total stock of international bank lending.

Chart A
Stock of international bank lending



Source: BIS.

BIS-area banks' business with non-BIS reporting countries

Lending to countries outside the BIS reporting area rose for the fourth consecutive year, and at a stronger rate than in 1993 (see Table 1). The developing economies of the Asian region were again the main recipients of the new lending. An increase of $50 billion to that region was dominated by increased lending to Thailand and South Korea, up $20.0 billion and $15.2 billion respectively. There were also large increases in lending to China ($7.8 billion) and Indonesia ($4.6 billion).

Table 1
Lending to, and deposits from, countries outside the BIS reporting area

$ billions

	Exchange rate adjusted flows					Stocks at end-1994
	1990	1991	1992	1993	1994	
Total lending	**-12**	**7**	**66**	**11**	**39**	**880**
of which:						
Developed countries	6	—	7	5	-2	161
Eastern Europe	-10	-1	4	-4	-13	80
Latin America	-31	-1	15	2	4	232
Middle East	-1	-8	16	-5	3	80
Africa	-1	-4	-1	-2	-2	40
Asia	26	21	26	15	50	287
Total deposits	**92**	**-12**	**13**	**-18**	**75**	**794**
of which:						
Developed countries	8	-3	11	10	22	149
Eastern Europe	-6	1	10	3	2	36
Latin America	25	-2	-2	-7	22	159
Middle East	26	-12	-7	-20	3	195
Africa	4	—	3	—	3	41
Asia	35	4	-1	-4	24	214

Source: BIS.

Totals may not sum because of roundings.

Lending to Eastern Europe fell significantly (by $13 billion), largely because of falls in lending to Poland ($5.6 billion), Bulgaria ($3.7 billion) and Russia ($3.3 billion).

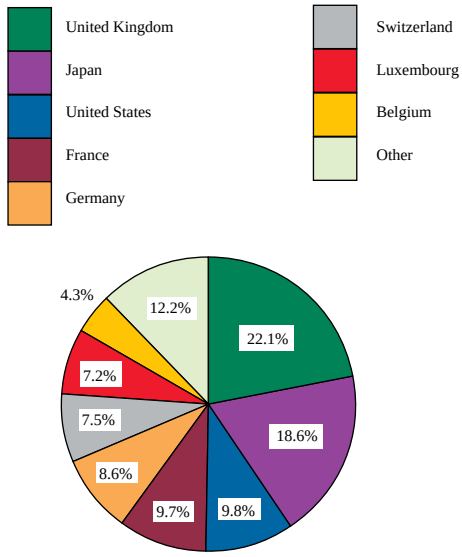
Deposits from countries outside the BIS reporting area also increased strongly during 1994, by $75 billion. The increased deposits were spread between Asia (up $24 billion), Latin America ($22 billion) and non BIS area developed countries ($22 billion). Within these regions, notable increases were reported by China ($10.3 billion), Brazil ($10.0 billion), Portugal ($7.1 billion), Greece ($5.5 billion) and South Korea ($4.9 billion). The largest fall in deposits was from Malaysia (down $9.5 billion), which had built up large increases during the previous two years. Saudi Arabia withdrew $3.9 billion of deposits, continuing its trend of recent years.

Analysis by centre and currency

The United Kingdom continued to increase its share of international lending (comprising foreign currency business within the United Kingdom as well as cross-border claims) during 1994. Outstanding cross-border loans by banks located within the BIS industrial area amounted to $5,425 billion at the end of 1994; as Chart B illustrates, 22% of this was lent by banks in the United Kingdom ($1,200 billion, up by 9% compared with 1993). The amount of foreign currency lending in the United Kingdom also increased, by $17 billion to $317 billion. Within the BIS industrial

(1) The BIS reporting area comprises: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States within the industrial area; and the Bahamas, Bahrain, Cayman Islands, Hong Kong, Singapore and Netherlands Antilles as offshore centres.
(2) Changes are adjusted so as to remove the effects of exchange rate movements on amounts outstanding. So changes are not simply the difference between the stock figures for two periods.
(3) Stock data are translated to dollars at end-year exchange rates; appreciation of a currency against the US dollar will therefore increase the value of foreign currency assets when converted into dollars.

Chart B
Cross-border lending transacted by banks within the BIS industrial area(a)



Source: BIS.

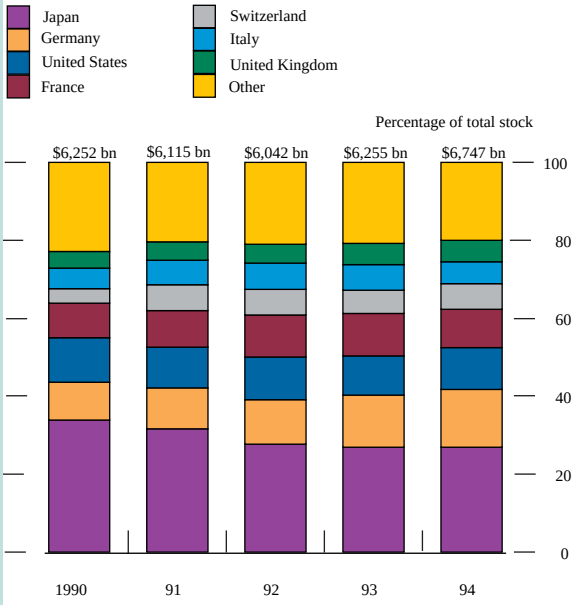
(a) BIS reporting countries other than offshore banking centres.

area, cross-border lending denominated in Japanese yen increased strongly (by $49 billion or 8%), following falls in recent years, while Deutsche Mark denominated cross-border lending fell (by $15 billion or 2%), following the previous year's strong increase. Cross-border lending in French francs also fell sharply (by $40 billion or 16%), as did lending in Ecu (by $20 billion or 8%).

Analysis by nationality of bank

Japanese banks remained the largest lenders of funds within the BIS reporting area, with 27.0% of international bank assets (see Chart C), virtually the same share as in 1993. German banks, the second largest group in terms of international business, again increased their share, to 14.8% from 13.2% in 1993. British-owned banks' share of business remained fairly constant at 5.4%.

Chart C
International bank assets by nationality of bank(a)



Source: BIS.

(a) Stocks at end-year, includes cross-border and domestic foreign currency lending.

Analysis of international banking business in London

Cross-border lending by banks in the United Kingdom increased by almost twice as much in 1994 as in the previous year (see Table 2). German-owned banks were particularly active (their business increased by $46 billion). American and Japanese-owned banks' business also increased, while British-owned banks' business fell for the first time in three years. Transactions in US dollars rose significantly (by $67 billion), increasing the dominance of the currency in this market.

Table 2
External lending of banks in the United Kingdom

$ billions

	Exchange rate adjusted flows					Stocks at
	1990	1991	1992	1993	1994	end-1994
By country						
BIS reporting area	90	-44	78	36	89	1,039
Outside reporting area:						
Developed countries	1	-1	3	1	—	35
Eastern Europe	-5	-3	-2	-1	-2	8
Latin America	-5	2	-1	3	-1	29
Middle East	—	-2	3	1	1	13
Africa	-1	-1	—	-1	-1	5
Asia	2	1	3	2	3	24
Other	6	3	-3	15	13	46
Total	**88**	**-45**	**81**	**56**	**102**	**1,200**
of which:						
By currency						
US Dollar	18	-52	38	-10	67	566
Deutsche Mark	18	-5	32	18	11	194
Sterling	8	-10	25	15	1	106
Yen	8	-30	-31	-12	8	79
Ecu 6	1	4	2	-9	38	
By nationality of bank (a)						
Japanese	-5	-57	-44	1	11	266
British	-1	-3	24	44	-2	209
German	28	5	33	23	46	202
American	10	2	4	7	27	129
Italian	20	2	4	-9	-1	71
French	5	2	13	-1	—	46

Totals may not sum because of roundings.

(a) Nationality flows only relate to monthly reporting banks, whereas other figures include quarterly reporting banks and some other financial institutions.

As in 1993, most of the new funds were lent to countries in the BIS reporting area (up $89 billion), and to the United States in particular (up $30 billion). Lending to Asian countries also increased ($3 billion), most notably to South Korea ($1.7 billion); lending to Eastern European countries continued to decline (by $2 billion).

Following the trend of previous years, lending by banks in the United Kingdom to other countries in the European Union continued to rise; it was up $49 billion or 13%. Deposits also rose (up by $26 billion or 6%), though more slowly than in 1993. These increases were largely attributable to business with Germany.

offer standardised price quotations for leading shares in all three exchanges. Less liquid shares will continue to be traded only in their local market. Plans were also announced for a strategy of computerisation and centralisation of German share trading.

It is not yet clear whether the changes in the structure of the sterling bond markets described above have had a significant impact on companies' choice between raising debt and equity issues. Overall, the reforms are expected to increase the relative attractiveness of issuing bonds, although industry sources vary markedly in their estimates of the likely impact. In the UK equity market, £1.2 billion ($1.9 billion) was raised from rights issues by UK and Irish companies during the second quarter of the year, compared with £1.4 billion raised in the first. 66 companies joined the Official List during the quarter; of these, 27 raised capital worth £1.1 billion in total, compared with £905 million in the preceding quarter. 32 companies from the Unlisted Securities Market (USM) transferred to the Official List during the second quarter of 1995, taking the total for the first half of 1995 to 56.

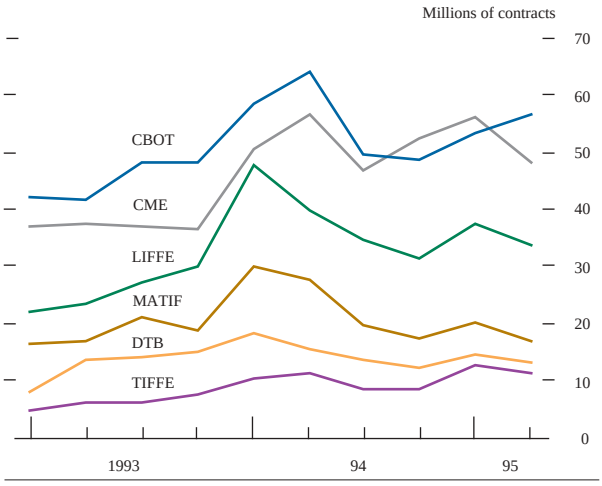
The Alternative Investment Market (AIM) was launched on 19 June replacing the USM; its inception brought to an end the transfer of companies to the Official List caused by the closure of the USM. There were 14 companies trading on AIM at the end of the quarter; the number is expected to increase when the transitional arrangements for Rule 4.2 companies end at the end of September.

In April, the Stock Exchange proposed a change to its listing rules to increase the minimum market capitalisation for the Official List; if approved, it will increase the differential between AIM and the Official List. In the same consultation, the Exchange is reviewing the rules for Initial Public Offers (IPOs), which require issues of more than £50 million to include an offer of shares to the general public. The review is aimed at addressing concerns that IPOs are more expensive than private placings. A further nine foreign companies were listed on the London Stock Exchange during the second quarter—bringing the total number of new overseas listings in 1995 to 16, compared with three for the same period in 1994.

Derivatives markets

On most major derivatives exchanges, the notional value of contracts traded was lower during the second quarter than during the preceding quarter, and well below the record levels set during the first half of 1994 (see Chart 7).(1) In part, this reflected lower volatility in some of the underlying markets, as shown by a steady reduction in at-the-money implied volatilities in a number of major financial option contracts over the period. In addition, the losses incurred by Barings—and other high-profile losses in OTC markets—continued to influence some users' willingness to engage in derivatives trading, leading them to reduce their level of activity.

Chart 7
Quarterly turnover on major derivatives exchanges



Of the world's major financial derivatives exchanges, the drop in turnover was most apparent in Europe. Volumes on the London International Financial Futures Exchange (LIFFE) were down 10% quarter on quarter and 15% year on year. This slowdown was also apparent on the DTB and MATIF—the main German and French derivatives exchanges—with volumes down 15% and 38% respectively compared with the second quarter of 1994. During the quarter, LIFFE's German Bund futures contract continued to challenge MATIF's *Notionnel* bond futures contract as Europe's most actively traded contract. The reduction in volumes on European exchanges trading by open outcry in particular have led some firms with large floor presences to reduce staffing levels.

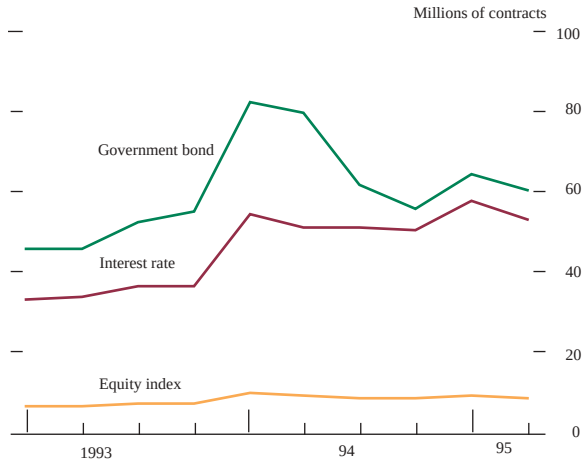
Volumes on the Chicago Mercantile Exchange (CME) were also depressed; they were down 14% compared with the previous quarter. Turnover in the CME's eurodollar futures contract also fell by 14% quarter on quarter, though it remained the world's most actively traded major contract. By contrast, in May LIFFE announced that no further delivery months would be listed in its eurodollar futures contract, because of falling volumes—attributed to competition from the CME and the Singapore International Monetary Exchange (SIMEX), which effectively straddle the European time zone. The option on the future was delisted with immediate effect. In contrast to the CME, volumes on the Chicago Board of Trade (CBOT) increased by 7% on the previous quarter, though activity was still below the levels recorded in the second quarter of 1994. Turnover in its US Treasury Bond futures contract was down 22% on the second quarter of 1994.

By contrast with Europe and the United States, volumes in the Far East appeared to be relatively buoyant compared with the same period last year. Turnover on the Tokyo International Financial Futures Exchange (TIFFE), for example, was down 14% on the first quarter of 1995, but largely unchanged from the same period a year earlier.

(1) Worldwide, turnover data showed a rise in the number of exchange-traded derivatives contracts traded during the first half of 1995 from the levels seen in 1994, but this reflected strong turnover growth in emerging futures markets which tend to be characterised by smaller contract sizes.

In comparison with exchange-traded derivative markets, data on OTC markets are less comprehensive and available only after a delay. In its latest biannual survey of derivatives activity, the International Swaps and Derivatives Association

Chart 8
Quarterly turnover of futures by type(a)



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

(ISDA) reported that the value of interest rate swap transactions during the second half of 1994 amounted to a notional principal value of $3,058 billion, down only slightly on the first half of 1994.(1) The notional principal value of currency swap transactions was $198 billion, up nearly 10% on the previous period. However, activity in interest rate options—representing a notional principal value of $663 billion—fell 22% compared with the first half of 1994. The total value of transactions outstanding at the end of 1994 amounted to $11,303 billion, a rise of over 33% on end-1993. Overall activity in swaps and related derivative transactions reported by ISDA for the second half of 1994 was higher than expected.

Disaggregated by currency, the data showed that at the end of 1994 US dollar interest rate swaps outstanding were 32% higher than at the end of 1993, and accounted for 37% of total activity. Transactions in yen and Deutsche Mark also grew rapidly, and were up 59% and 45% respectively. The yen accounted for 23% of interest rate swap activity during 1994 while the Deutsche Mark accounted for 10%.

Market participants report a slowdown in OTC turnover in the first half of 1995, though this broad trend masked a pick-up in March—as a result of turbulence in underlying currency markets—and more buoyant activity towards the end of the second quarter. Demand for complex, structured OTC derivatives has been particularly muted.

Exchange developments

During the quarter, the membership of CBOT approved the plan to develop an open outcry link with LIFFE enabling each exchange to trade the other's most liquid government debt contracts. The link—to be implemented in stages, beginning with the Bund and US Treasury Bond contracts—still requires regulatory approval. In addition, the International Petroleum Exchange's (IPE's) mutual offset agreement with SIMEX, allowing it to trade the IPE's Brent futures contract in the Asian time zone, came into operation in June.

At the end of June, LIFFE introduced a basis trading facility, initially on its Bund futures contract. This facility allows for the simultaneous purchase or sale of cash instruments and an offsetting purchase or sale in the futures market. If it is successful, the exchange is likely to introduce the facility on other contracts—in particular the long gilt futures contract—in the near future.

LIFFE also launched a flex option contract on the FT-SE 100 index in June. This allows participants to tailor the exercise price and expiry day of the option, subject to a maximum maturity of two years. The CME also listed dollar-denominated flex options on a range of world equity indices, including the FT-SE 100, S&P 500 and Nikkei 225 indices.

The DTB announced plans to launch a dollar-denominated dollar/Deutsche Mark currency option contract towards the end of the year. In a separate development, it delisted its extra-long German government bond futures contract (Buxl) a year after its launch. Turnover in the contract had been low; this was attributed to the low turnover in the underlying bond market.

The choice of the two MATIF contracts to be taken off its trading floor and listed on the Tradeus electronic link with the DTB was further delayed during the quarter. The DTB and MATIF announced that there were to be further negotiations, also involving the Paris Bourse and the Deutsche Börse, to discuss linking the two countries' stock exchanges in conjunction with their futures markets. Stage two of the link-up, in which two MATIF contracts are transferred to the system, is due to start by the end of the year.

(1) Data have been compiled from 88 international swap dealers.

Inflation targets

By Andrew Haldane of the Bank's Monetary Assessment and Strategy Division.

In June, the Government updated its inflation target: the authorities will continue to aim at a target for RPIX inflation of 2½% or less beyond the end of the present parliament.

Earlier this year, the Bank organised a conference attended by representatives of the central banks of countries using inflation targets as the basis for their monetary policy framework. This article summarises a number of the main issues—both conceptual and technical—raised by the use of inflation targets, which were discussed at that conference.

Introduction

In his Mansion House speech on 14 June, the Chancellor updated the Government's inflation target. The authorities will continue to aim at a target for RPIX inflation—the twelve-month change in the retail prices index excluding mortgage interest payments—of 2½% or less beyond the end of the present parliament (when the earlier target expires). This is in line with inflation objectives in the rest of Europe. And its attainment would mark a considerable improvement in the United Kingdom's inflation performance compared with the average during the post-war period. The Chancellor added that setting interest rates consistently at the level judged necessary to achieve the inflation target of 2½% or less should ensure that inflation will remain in a range of 1%–4%.

In March of this year, the Bank of England held a conference of central banks from those countries currently using inflation targets. Apart from the Bank of England and the Treasury, there were representatives from the Reserve Bank of Australia, the Bank of Canada, the Bank of Finland, the Bank of Israel, the Reserve Bank of New Zealand, the Bank of Spain and the Sveriges Riksbank. The aim of the conference was to discuss the main issues raised by inflation targets as a monetary policy framework, and to share experiences on their operation to date.(1)

This article discusses the historical backdrop to the adoption of inflation targets and some of the main issues raised by their use; it draws in places on contributions made at the conference. Some of these issues are conceptual and some narrowly technical: the article looks at each in turn.

The origin of inflation targets

Inflation targets are not a new concept. Their intellectual history can be traced back at least to the last century.

Writing in 1887, the British economist, Alfred Marshall, advocated a monetary system which 'adjusted to fix the purchasing power of each unit of the currency closely to an absolute standard'.(2) And later, in 1898, the Swedish economist, Knut Wicksell, advocated an explicit price-level standard for monetary policy.(3) Thirty years on, Sweden operated with such a price-level target during the early part of the 1930s.

As now, support for such a framework was far from universal. But the American economist, Irving Fisher, was one prominent proponent. Foreshadowing the Swedish experiment, he wrote in 1922:(4)

> 'For a hundred years the world has been suffering from periodic changes in the level of prices, producing alternate crises and depressions of trade. . . . It is not too much to say that the evils of a variable monetary standard are among the most serious economic evils with which civilisation has to deal; and the practical problem of finding a solution of the difficulty is of international extent and importance.'

That practical problem was not widely accepted—much less acted upon—in the decades following the Second World War, when monetary policy was instead geared principally to demand management. But the intellectual climate changed in the 1970s. Monetarism—domestic or international—took centre-stage. And attention gradually refocused on price stability as the appropriate medium-term objective of monetary policy.

At first, this objective was generally pursued using *intermediate* policy targets, whether for money or the exchange rate. The idea was that by regulating the intermediate variable, the ultimate objective—price stability—could be attained indirectly. It is only recently

(1) The proceedings of the conference, including a record of the discussions, will be published by the Bank later in the year.
(2) See Marshall, A (1887), 'Remedies for fluctuation in general prices', *The Contemporary Review*.
(3) See Wicksell, K (1898), *Interest and prices*, MacMillan.
(4) See Fisher, I (1922), *The purchasing power of money*, MacMillan.

Inflation objectives in selected countries

Country	Price index	Quantitative objective (for annual inflation)	Time-specific?	Exemptions and caveats
Countries with inflation targets				
Australia	CPI	Average of 2%–3%	No: medium-term.	Mortgage interest payments, government-controlled prices and energy prices.
Canada	CPI	1%–3% between 1995 and 1998	Yes	Indirect taxes, food and energy prices (operational exemption).
Finland	CPI	About 2% from 1995	No	Housing capital costs, indirect taxes and government subsidies.
Israel	CPI	8%–11% for 1995	Yes: updated annually.	None.
New Zealand	CPI	0%–2%	Yes: updated annually.	Commodity prices, government-controlled prices, interest and credit charges.
Spain	CPI	Below 3% by 1997	Yes	Mortgage interest payments.
Sweden	CPI	2% +/-1% from 1995	No	None.
United Kingdom	RPIX	2½% or less	No	Mortgage interest payments.
Countries with medium-term inflation objectives				
France	CPI	Upper limit of 2%	In part: for 1995 and the medium term.	None.
Germany	CPI	Upper limit of 2%	No: medium term.	None.

that the possibility of targeting inflation *directly* has come to the policy forefront.

To date during the 1990s, a number of countries have adopted a monetary policy framework centred on explicit inflation targets. Such a framework was first adopted in New Zealand in 1990, under the Policy Targets Agreement. This followed the 1989 Reserve Bank of New Zealand Act, which had established a statutory commitment to price stability. Canada followed in February 1991—by introducing inflation-reduction targets, in a joint declaration by the Bank of Canada and the Canadian government. Since then, inflation targets have been adopted in Israel in December 1991; in the United Kingdom in October 1992; in Sweden and Finland in the early part of 1993; in Mexico in September 1994; and, most recently, in Spain in November of last year.(1)

Almost all the inflation-target countries represented at the Bank's conference had used some form of intermediate target at an earlier stage. The adoption of a final-target strategy had, in part at least, been the result either of disillusionment with monetary aggregates as a nominal anchor (as, for example, in Canada); or of problems in maintaining an exchange rate peg (for example in Sweden and Finland); or of a combination of the two (as, for example, in the United Kingdom). In some cases, the adoption of an inflation target had not led to the complete abandonment of other, intermediate targets. Israel and Spain, for example, continue to pursue an exchange rate objective in tandem with their inflation targets.

A number of the countries that continue to use intermediate targets have found it useful also to state their medium-term price-stability objectives explicitly: Germany and France are two European examples. The table above summarises the inflation targets used in those countries that have adopted them, and also identifies price-stability objectives in some countries not using inflation targets. As it shows, even among those countries with inflation targets, some inflation objectives are more specific than others. Indeed, because almost all central banks now identify price stability as the primary objective of monetary policy, in classifying policy frameworks it is probably more helpful to look at how specific a country's inflation objective is, rather than to distinguish between intermediate and final-target countries. The next section considers this latter distinction further.

Conceptual issues in inflation targeting

Intermediate and final targets

It is now widely accepted that price stability should be the primary objective of monetary policy. As a theoretical matter, this focus follows from the proposition that in the long run the level of real activity is invariant to monetary policy: money is *neutral*. Money-neutrality has wide—though by no means universal—academic support. And it implies that, in equilibrium, the most that monetary policy can achieve is a desired rate of inflation or price level. Because the end-product of monetary policy actions are inflation outcomes, countries with inflation targets are often said to pursue *final-target* strategies. They are thereby distinguished from countries pursuing *intermediate-target* strategies—using either the exchange rate, or some measure of money or credit.

Ultimately, however, the distinction is probably more semantic than economic. Any country adhering to a monetary target, for example, must implicitly have a price objective embedded within this target, just as implicit assumptions have to be made about trends in the velocity of circulation of money and in real activity. And likewise

(1) It is difficult to date precisely the introduction of an inflation objective in Australia; it has gradually increased in importance over the past couple of years.

within a managed exchange rate regime, where the aim of monetary policy is to import the inflation performance of the 'anchor' currency. So, in terms of the objectives of policy, final and intermediate-target approaches have clear similarities.

The two approaches might differ in the method by which monetary policy is steered towards these objectives. But again, in practice this difference is easily exaggerated. The rationale for intermediate targets rests on the lags in the transmission of monetary policy impulses through to final demand and to prices; given these lags, intermediate indicators may be useful as guideposts for monetary policy decisions, provided they can offer accurate early-warning signals of incipient inflationary pressures. To serve this role, an intermediate indicator must satisfy three criteria: it must be *controllable*, using the available monetary policy instruments; the relationship between it and the final objective must be *predictable*; and it must be a *leading indicator* of future nominal variables.

But it would be wrong to think that final-target approaches dispense with the need for intermediate variables. Indeed, the United Kingdom's inflation-target approach has them at its centre.(1) These intermediate variables are manifold. One influential example is the Bank's inflation projection—published quarterly in the *Inflation Report*. Because the projection offers advance warnings of inflationary pressures which then serve as a guidepost for monetary policy decisions, it is plainly an intermediate variable. And it is clearly also actively used by the UK monetary authorities. Moreover, because it is a forecast conditional on monetary policy instrument settings,(2) is unbiased and is explicitly forward-looking, the Bank's inflation projection satisfies all three criteria required of any robust intermediate variable.

The Bank's inflation projection—when taken alongside the other intermediate variables which make up the inflationary assessment—influences monetary policy decisions in much the same way as does any other intermediate variable. If expected inflation is thought to lie above target, then the presumption is that the Bank should advise that monetary policy ought to be tightened; and conversely when the projection lies below the target. In practice, the risks on either side of the central projection also have a bearing on the advice the Bank offers. These risks may sometimes be asymmetric, in which case the Bank might advise a change in monetary policy despite the central projection being in line with the inflation target.

Conducting monetary policy in this way is equivalent to following a monetary policy *feedback* rule: judgments on monetary policy depend on—or feed back from—the deviation between expected inflation and the inflation target. There is a substantial literature, both theoretical and empirical, on the performance of feedback rules of this type. Most of it points to the superiority of feedback rules over more mechanistic formulations, such as a fixed *k*% money-growth rule or a rigidly fixed exchange rate regime.(3) Feedback rules are, in general, welfare-improving. Whether any particular rule is 'optimal'—or welfare-maximising—depends on the variables used in it and the weights applied to them. This issue is discussed below.

To summarise, the differences between intermediate and final-target approaches may be more apparent than real. The approaches have the same (or similar) goals. And both actively use intermediate information variables. The differences between them relate mainly to the different weights they place on the indicators feeding into the forward-looking inflation assessment. A country pursuing a strict intermediate monetary target will place a large—possibly 100%—weight on money growth relative to its target. What weights do inflation-target countries place on monetary and other information variables?

Policy-making using information variables

In the United Kingdom's monetary framework, a wide array of real and monetary indicators—or *information variables*—are used to gauge incipient price and spending patterns. The latest Financial Statement and Budget Report refers to monetary aggregates (broad and narrow), the exchange rate and other asset prices, inflation expectations, measures of activity, fiscal policy, and prices and costs as among the indicators routinely assessed when setting monetary policy. And this eclectic approach is evident too from the detailed disaggregated analysis included in the Bank's *Inflation Report*, and from the discussions at the monthly meetings between the Chancellor and Governor, the minutes of which are now published. This 'look-at-everything' approach is not unique to inflation-target countries: most countries make explicit reference to a range of indicators when forming their inflation assessment; and in the United Kingdom, it has been standard practice from as early as the 1970s to look at a wide range of information variables.

The Bank's inflation projection provides one of a number of useful summary statistics of the inflationary information content of these myriad indicators: it draws the disparate set of information into a consistent, and easily monitored, whole. But the inflation projection is not derived mechanistically; it is not simply extracted from a model of the economy. Nor—even in theory—should it be. For when monetary policy is set, there is a premium on using *all* useful indicators, irrespective of their causal significance and so irrespective of whether or not they have a role to play in such a model.(4) As a consequence, the inflation projection draws in other (than model) information—including from

(1) For the genesis, technical details and history of the United Kingdom's inflation target, see Bowen, A (1995), 'Inflation targetry in the United Kingdom', *mimeo*, Bank of England.
(2) It is conditional, in particular, on short-term official interest rates remaining unchanged.
(3) See, for example, Friedman, B M (1975), 'Targets, instruments and indicators of monetary policy', *Journal of Monetary Economics, 1*, pages 443–73; Buiter, W H (1981), 'The superiority of contingent rules over fixed rules in models with rational expectations', *Economic Journal, 91*, pages 647–70; Dotsey, M and King, R G (1986), 'Informational implications of interest rate rules', *American Economic Review, 76*, pages 33–42; and Haldane, A G (1995), 'Rules, discretion and the United Kingdom's new monetary framework', *mimeo*, Bank of England, for a summary.
(4) Friedman (*op. cit.*) illustrates how structural causality between indicator and target variables is irrelevant when using an information-variable approach.

time-series leading-indicator models, from surveys of various sorts, from economic theory and from information received from the Bank's agents around the country. Judgment also plays a crucial role in arriving at the projection.

In addition, the focus in the *Inflation Report* has increasingly shifted from the Bank's central inflation projection towards looking at the *distribution* of likely inflation outcomes around this projection. The confidence intervals included in the chart in the *Inflation Report* that gives the inflation projection are the clearest indication of this. These offer some information on the likely scale of the risks surrounding the central projection, based on past forecast errors. Other information—and judgment—also help when weighing up the balance of inflation risks around the central projection, especially when these risks are thought to be asymmetric.(1)

At the inflation-targets conference, it was clear that most of the other central banks pursuing inflation targets use information variables in a similar way to the United Kingdom. Initially, the introduction of an inflation target seems to have had a limited impact on the mechanics of monetary policy formulation. But slowly, the inflation target has grown in importance—not least by focusing attention on the inflation outlook two years ahead.

In many countries, the most important mechanical change resulting from the adoption of inflation targets is the increased emphasis on inflation projections. Making such projections, it was argued, is inescapable. Monetary policy-making—however conducted—requires a forward-looking assessment of inflationary trends. Indeed, by underlining this, inflation targets had, in the view of most countries, fulfilled an invaluable educational role. Policy discussions no longer sought to answer the question: 'What is the desirable point on the short-run output/inflation trade-off?' Instead, they centred more often on: 'Where is inflation going to be two years hence?'

For most inflation-target countries, the central bank's model-based extrapolations provide the starting-point in the information-assimilation process: they provide a baseline, ensuring consistency in the projection (in an accounting sense) and serving to highlight the key structural factors impinging on the projection. To this baseline is then added further information, including from leading-indicator models, economic theory and judgment—as in the United Kingdom.

But projections bring their own problems. There was universal acknowledgment at the conference of the significant degree of uncertainty surrounding inflation projections. More than one representative noted that, in practice, projections do little better than a random walk—a 'no-change' forecast—in predicting inflation over the short run. But some of this uncertainty is simply intrinsic—the product of unpredictable shocks to behavioural variables or relationships. And encouragingly, there is evidence from some countries that the errors in inflation projections may themselves have diminished recently in a low-inflation environment. This would be consistent with the stylised fact that the variability of inflation is lower at low rates of inflation.

Because of these uncertainties, most of those at the conference believed that an awareness of the balance of inflation risks was as important as the central projection. They were thus shifting—implicitly or explicitly—towards a probabilistic approach towards monetary policy formulation. Off-model information in general, and judgment in particular, was judged to play a significant role in pinpointing the balance and scale of risks around the central projection. To summarise, there appear to be some striking similarities between the mechanics of monetary policy formulation among inflation-target countries: in particular, the emphasis placed on inflation projections as a summary statistic of the information contained in the various indicators which are monitored; and the heightened focus on the distribution of inflation outcomes around this projection.

So how does this 'look-at-everything' and probabilistic final-target approach compare with the alternatives, such as single-variable intermediate targeting? In the limit, intermediate variable approaches can be thought to place a 100% weight on a single indicator. But according to economic theory, the 'optimal' feedback rule will typically take account not of a single variable—whether broad money or anything else—but of a whole set of information variables. To do otherwise is unnecessarily and arbitrarily to restrict the arguments, and so the information, entering the authorities' feedback rule. Moreover, a 'look-at-everything' approach can act as an insurance policy against the type of model uncertainties that policy-makers routinely face. An analogy can be drawn with a standard portfolio choice problem to illustrate this.(2)

Monetary policy-makers, like investors, are risk-averse utility-maximisers. They are obliged to make a difficult choice among assets (information variables) yielding uncertain future returns (information). In an uncertain world, the optimal asset portfolio will typically be a diversified one—for the reason that it normally does not pay to put all your eggs in one basket. The same logic applies to the optimal policy portfolio. For example, a diversified policy portfolio helps, in part at least, to insulate the policy-maker from money velocity shocks; whereas clearly if money growth is used as a single intermediate variable, such insulation is not possible. Even if money embodied all useful information on future inflation, inflation-targeting would still be at least as good as money-targeting: both would simply place 100% weight on money outcomes. If, as seems more realistic, money is not information-encompassing, however, inflation-targeting will mean looking at a full range of information variables,

(1) The risks implied by forecast error bands are, by construction, symmetric.
(2) Brainard was one of the first to liken optimal policy decision-making to optimal portfolio choice theory; see Brainard, W (1967), 'Uncertainty and the effectiveness of policy', *American Economic Review*, *57*, pages 411–25.

suitably weighted, when framing monetary policy decisions. And this is then a preferred—diversified—policy portfolio.

Viewing policy as a portfolio problem—with similar uncertainties and unknowables—lends strong support to 'look-at-everything' monetary policy strategies. Inflation projections serve as a portmanteau for this mass of information. They thereby allow simple monitoring of policy assessments and actions—especially when the projection is published, as in the United Kingdom. Such transparency about policy actions and intentions can itself enhance monetary policy credibility, for reasons discussed below.

The institutional setting for monetary policy

Following the adoption of inflation targets, a number of countries appear to have altered significantly—if gradually—their *internal* process of monetary policy formulation. At the same time, there has been a discernible shift towards greater openness and transparency in the policy process in many countries; the United Kingdom has itself made significant strides towards greater monetary policy transparency over the past few years. So recent changes in the monetary policy framework both in the United Kingdom and overseas may have an *external* dimension as well. Economic theory helps explain the benefits such transparency confers.

Many economists have identified a potential problem of 'inflation bias' when policy-makers are given complete discretion over monetary policy decisions.(1) This bias emerges when policy-makers have an incentive to spring inflationary surprises on private sector agents so as to reap the transient output rewards these might bring. As agents come to build the risk of such surprises into their expectations when setting prices, a higher equilibrium inflation rate obtains. In short, discretion in monetary policy imparts an endemic inflation bias, in the absence of some way of 'tying policy-makers' hands'.

A number of theoretical resolutions to this inflation bias problem have been put forward. These serve as a useful counterpoint to recent changes in the institutional setting for monetary policy in many countries—not least those countries with inflation targets.

One way of eliminating inflation bias is to increase the authorities' incentives to invest in a *reputation* for monetary rectitude: fears of damaged long-term reputation may dissuade policy-makers from pursuing short-term objectives. Just how great these incentives are will depend on the authorities' rate of time preference: the more they favour jam today over jam tomorrow, the less likely it is that fears of a diminished reputation will curtail inflation biases.

A second way is to *delegate* responsibility for monetary policy to a body with an explicit mandate to pursue price stability—a 'conservative' central banker.(2) Like reputation, delegation serves to lengthen the policy-makers' effective planning horizon, so lessening inflation bias.

A third solution is to write a *contract* for the central bank. Suitably designed, such a contract could provide the central bank with the right incentives not to pursue inflation-biased policies, by penalising it if the inflation target was breached.(3) A number of researchers have shown that, under certain assumptions, a linear tax levied on the central bank when inflation is above target could secure just such an optimal outcome.

The adoption of inflation targets—and the greater policy transparency that has accompanied them—can be seen as one practical response to the inflation bias problem: these developments can be likened to the reputation or delegation solutions. The existence of the target increases the importance placed on inflation stabilisation by the authorities, so reducing the relative attraction of the short-run output gains from surprise inflation. Monetary policy myopia is thus reduced. And as agents learn about the authorities' longer-term policy preferences, inflation biases are reduced too. Several central banks at the conference commented on exactly this behavioural shift: private sector agents had begun to lower their inflation expectations as it became clear that the focus of policy debate had shifted towards meeting the inflation target.

Greater transparency about monetary policy-making can assist in this process. By making clear the nature of internal policy debate and the incentives that drive monetary policy decisions, transparency defuses inflation biases. The scope for surprising the public—by inflating and gaining the short-run output rewards—is severely constrained if the monetary policy process is highly transparent. Private sector agents will quickly detect any myopic monetary policy strategy. And they will penalise the authorities for it by raising their inflation expectations, so that monetary policy credibility is instantly sacrificed. With this at stake, the authorities have less incentive to inflate in the first place—thereby diminishing inflation biases.

In the United Kingdom, the publication of the Bank's *Inflation Report* and of the minutes of the monthly meetings between the Chancellor and the Governor have made clear the focus and orientation of monetary policy decisions. They have also made the Bank more accountable for its advice on monetary policy—as has the decision to give the Bank discretion over the timing of interest rate changes. To borrow a term from the banking literature, the Bank has over the last few years become a 'delegated monitor' of inflation: it has been given the explicit task of monitoring inflationary

(1) This was first established formally in Kydland, F E and Prescott, E C (1977), 'Rules rather than discretion: the inconsistency of optimal plans', *Journal of Political Economy*, 85, pages 473–91. It has subsequently been popularised in the monetary policy game of Barro, R J and Gordon, D (1983), 'A positive theory of monetary policy in a natural rate model', *Journal of Political Economy*, *91*, pages 589–610.
(2) The notion of a 'conservative' central banker is Rogoff's; he discusses solutions such as this to the inflation bias problem in Rogoff, K (1985), 'The optimal degree of commitment to an intermediate target', *Quarterly Journal of Economics*, *100*, pages 1,169–89.
(3) For discussions of contractual solutions of this sort, see Walsh, C E (1993), 'Optimal contracts for independent central bankers: private information, performance measures and reappointment', *mimeo*, University of California, and Persson, T and Tabellini, G (1993), 'Designing institutions for monetary stability', *Carnegie-Rochester Conference Series on Public Policy*, *39*, pages 53–84.

trends in the United Kingdom and offering independent advice on monetary policy; and recently this advice has been made fully transparent to private sector agents.

But if the Bank is to serve as an effective monitor, some method of monitoring its advice is also necessary. The *Inflation Report* has again been central in ensuring effective monitoring here. The publication of the Bank's inflation projection, and its accompanying analysis, allows its analytical competence and advice to be monitored—and, if necessary, questioned. This, in turn, increases the incentive for the Bank to ensure its analysis is of high quality.

Among other countries with inflation targets, there is a spectrum of positions on policy transparency. There has, however, been a general shift in recent years towards greater openness. New Zealand is at one end of the spectrum (with the United Kingdom). It publishes both inflation projections and forecasts for other variables. No inflation-target country other than the United Kingdom publishes the minutes of the regular meetings of its monetary policy council.(1)

Most inflation-target countries at the conference were in the process of reviewing publication and transparency issues. Some had plans to publish an *Inflation Report* or something similar. For example, the Bank of Spain began publishing its *Inflation Report* in March of this year; and the Bank of Canada published its first twice-yearly *Monetary Policy Report* in May. These countries have joined the United Kingdom, New Zealand and Sweden, which began publishing reports of this kind following their adoption of inflation targets.

But greater policy transparency is not costless. It is perceived by many inflation-target countries to carry risks, not least heightened market sensitivity to policy announcements and publications. These costs—allied with the recognition that, once secured, greater transparency is difficult to reverse—have led many central banks to move cautiously. But, on the basis of experience to date, the benefits of greater openness are perceived by most countries to have far outweighed the costs. This is all the more encouraging given the substantial differences in legislative status and degree of autonomy among inflation-target central banks.

Few countries have explicitly pursued the contractual solution to the inflation bias problem. But New Zealand's Policy Targets Agreement is one notable exception, since it contains a provision for the dismissal of the central bank governor in the event of the inflation target being breached. This provides the central bank with a statutory incentive not to pursue inflation-biased policies—even though it is not strictly a *linear* tax on above-target inflation outcomes. The fixing of the Reserve Bank of New Zealand's budget in nominal terms *is* akin to such a linear tax, however, even though it was not expressly designed with that intention.(2)

Technical issues in inflation targeting

Although price stability has assumed pre-eminence among monetary policy objectives in recent years, precise definitions of price stability have remained rather elusive.(3) The issue is by no means trivial. It touches on a number of technical questions: which price index to target? what mid-point to aim for? whether to have a range or exemptions? Existing theory and empirical evidence is able to provide only tentative answers to these.

Choice of price index and exemptions

Virtually all countries with inflation targets define them over a basket of retail, or consumer, goods—a retail prices index (RPI) or consumer price index (CPI). Such indices are well understood, timely and subject to little revision. The only major alternative as a target price index would be the GDP deflator. This has the advantage of wider coverage but is less well understood, available only with a lag and often subject to substantial revision. The differences between the competing price indices may, in any case, be fairly small over a long horizon.(4)

For operational purposes, countries with inflation targets often focus on measures of 'underlying' inflation; that is, targeted price indices are frequently qualified with exemptions or escape clauses—explicit or implicit—for certain types of price shock which, it is believed, monetary policy may legitimately accommodate. In the United Kingdom, for example, the inflation target is expressed in terms of RPIX inflation—retail prices excluding mortgage interest payments. Use of this index prevents monetary policy actions—changes in short-term interest rates—having an initially perverse impact in relation to their final objective.(5)

Whether to exclude an economic shock from a price index—and so 'excuse' it when setting monetary policy—is, however, far from clear cut. It depends critically on the shock's origin and its expected persistence. For example, no countries seek to exempt the effect of *demand* shocks—such as shocks to government expenditure or changes in the 'animal spirits' of private sector agents. The inflationary influence of these types of shock is legitimately offset by monetary policy actions.

The case for exemption is perhaps strongest for *supply* shocks, such as indirect tax changes and exogenous terms of

(1) In Canada, however, the central bank governor's comments to the Board of Directors on monetary policy are published following the subsequent Board meeting.
(2) See Canzoneri, M B, Nolan, C and Yates, A (1995), 'Mechanisms for achieving monetary stability: inflation targeting versus the ERM', *mimeo*, Bank of England.
(3) See Goodhart, C A E and Vinals, J (1994), 'Strategy and tactics of monetary policy: examples from Europe and the Antipodes', *Banco de Espana Documento de Trabajo No 9,425*.
(4) Bank research has found that the price indices most often used in the United Kingdom cointegrate with one another, that is they share similar long-term trends; see Yates, A (1995), 'Room for manoeuvre? The problem of designing inflation targets', *mimeo*, Bank of England.
(5) Excluding mortgage interest payments excludes at least their *first-round* effects. But if, for example, nominal wages are set on the basis of headline inflation, then there is a *second-round* effect on prices from an interest rate change, and therefore still scope for a perverse impact on 'underlying' inflation measures.

trade shocks. These generate a once-and-for-all change in the equilibrium price *level* but, of themselves, should not affect *inflation* over the longer run.(1) Because they do have a temporary effect on measured headline inflation, however, this effect might legitimately be excluded from targeted price indices. For example, suppose there is an adverse terms of trade shift, induced by a one-off rise in oil prices. The price level will shift upwards and activity will contract. If monetary policy attempts to offset—rather than exempt—the transient effect of this shock on measured inflation, then activity will be depressed further, worsening the impact on output of the initial shock.(2)

So should all supply shocks be excluded from price indices? Again, there are no simple rules. Indirect tax changes provide perhaps the easiest case. It is straightforward to identify these when they occur. And it is also relatively easy to adjust price indices to take account of their first-round effects.(3) Reflecting this, indirect tax changes are excluded from the price indices used for operational purposes in, among other countries, Finland, New Zealand and Canada. In the United Kingdom, an RPIY measure of inflation—which excludes indirect taxes as well as mortgage interest payments—has been published and analysed by the Bank for some time. Responsibility for constructing this measure has recently passed to the Central Statistical Office.

Despite the attractions of the RPIY measure, in practice it is unclear whether an explicit quantitative (rather than implicit qualitative) exemption of indirect tax effects is actually necessary—either for the authorities when gauging underlying inflationary pressures, or for private sector agents when monitoring inflation performance. And if price indices are meant to capture the prices people actually pay for goods, then excluding indirect taxes may be inappropriate, since these constitute a genuine cost to consumers.

Partly for these reasons, there was no clear consensus among representatives at the conference whether indirect taxes should be excluded from targeted price indices. The choice is finely balanced. The United Kingdom's inflation target is defined in terms of RPIX inflation, which includes indirect taxes. As in other countries, however, the UK authorities monitor a range of inflation indices when gauging underlying inflationary pressures.

The picture is still less clear in the case of terms of trade exemptions. At a practical level, the identification of one-off terms of trade shocks is far harder than with indirect tax changes. The exclusion of their first-round effects from price indices is also more problematic, because these effects show up to differing degrees across a range of goods and services. And from a theoretical perspective, it is by no means clear that all terms of trade shocks should be excluded *equally*. For example, equal and offsetting changes in export and import prices may have the same substitution (price) effect on demand; but their income effects may well work in opposite directions—which may, in turn, call for different treatment. For these reasons, most countries have—if anything—preferred *qualitative* exemptions for external price shocks.

There is a third class of supply shocks—those deriving from changes in domestic private sector behaviour—which no country has sought to exempt. For example, the recent effects of increased competition within the UK retail sector are not exempted. Because such supply-side influences are rooted in private sector behaviour, the effects are usually difficult to identify and may be spread over a long period rather than being one-off. It seems to be for these practical reasons that explicit exemptions have not been sought—even though, in principle, the effect of these supply shocks is the same as any other.

Looking across inflation-target countries, other criteria have also often been used to justify exemptions. In some countries, the most volatile or seasonal components of price indices are sometimes excluded: for example, food and energy prices are excluded from the operational measure of inflation used by the Bank of Canada. And in New Zealand, government-administered prices outside the control of the central bank are exempted.

It is difficult to judge where best to draw the line in exempting shocks. There is clearly a balance to be struck between having a genuine underlying (fully state-contingent) inflation measure on the one hand, and having a measure which adequately captures the costs of inflation on the other. Some measures of underlying inflation may not pick up the true cost of inflationary fluctuations—which would defeat the purpose of targeting inflation in the first place. For example, excluding terms of trade changes from price indices in small, very open economies may not be sensible, because many of the costs of inflation in these countries derive precisely from external fluctuations. It was clear from the conference that there is no universally agreed criterion by which to judge which shocks should be excluded. Further empirical and theoretical work on the costs of inflation is needed, since ultimately it is these costs which should decide inflation target exemptions.

Mid-point of a target range

The question of the appropriate mid-point for an inflation target turns on two issues—one theoretical and one statistical.

The *theoretical* issue is: what is the 'optimal rate of inflation'? A number of arguments have been put forward to suggest that it may be positive. One of these centres on the so-called 'Summers effect'. Nominal interest rates cannot in normal circumstances be negative, which may in turn

(1) Again, this should be understood in relation to the first-round effects of a terms of trade shock, and not to any induced second-round effects via a wage-price spiral.
(2) See, for example, Bean, C R (1983), 'Targeting nominal income: an appraisal', *Economic Journal*, *93*, pages 806–19, which shows that nominal income targets may induce a preferred monetary policy response to supply disturbances.
(3) Adjustment does, however, typically involve an assumption of full and immediate pass-through of the tax change into retail prices. And the validity of this assumption varies both across time and across goods, depending upon the microstructure of the goods market and prevailing demand conditions.

circumscribe the monetary authorities' ability to secure *negative* real interest rates if inflation is targeted at zero.(1) A second argument, owing originally to Tobin, is that inflation may serve as a lubricant for the price mechanism. If there are downward rigidities in nominal wages, then positive inflation may be an easier—and less costly—way of engineering the real-wage adjustments often necessary for efficient factor reallocation. These downward nominal rigidities may result in a higher short-run trade-off between output and inflation at low rates of inflation: reducing inflation by a further percentage point will be increasingly costly in terms of output forgone.(2)

Identifying these arguments for a positive rate of inflation is one thing, quantifying them empirically quite another. The empirical evidence is often equivocal. For example, work on the United Kingdom, United States and Canada has often failed to find evidence of sizable downward rigidities in nominal wage behaviour.(3) And evidence of downward rigidities in nominal prices is also mixed. Further, even if these rigidities were shown to be important, it is arguable whether monetary accommodation would be a better way of dealing with them than remedying the source of the rigidity in the first place.

Likewise on the Summers effect, it is questionable whether negative—rather than just below-equilibrium—real interest rates are actually ever necessary to boost output. And monetary accommodation may in any case be a less effective solution than, say, fiscal accommodation. From all of this, it is quite difficult to mount a wholly convincing case for an 'optimal rate of inflation' very different from zero.

The *statistical* issue is: how large are the biases in measured inflation? There are a number of sources of bias. One is 'substitution bias', which arises because the fixed weights used in CPIs may fail fully to capture product substitution, in favour either of cheaper goods or cheaper retail outlets. A second results from CPIs' inability fully to reflect improvements over time in the quality of goods and services: today's television is not that of ten years ago. Estimates of these various biases have been calculated in North America. They vary, but most central estimates do not exceed one percentage point a year. Estimates in Canada, for example, have put an upper bound of around 0.6 percentage points a year on measurement biases.(4) Preliminary work in the United Kingdom has suggested estimates of the same magnitude. And representatives at the conference reported similar results for their countries.

An inflation target mid-point of around 1%—to allow for estimated bias in measured inflation—is somewhat lower than the current mid-point in most countries (see the table above); New Zealand's 0%–2% range is the only exception. But for many countries, inflation targets are still at an early stage. And it is crucial then that the targets are realistic (given the starting-point for inflation) and are met, so that credibility can begin to be acquired.

A number of those at the conference argued that the mid-point of the inflation target should be stated explicitly, irrespective of whether or not there is a range around it. This would make the target for forward-looking monetary policy decisions fully transparent. Regardless of where inflation was within the band, the expectation would be that monetary policy is aiming at the inflation target mid-point. The danger of announcing only a target band, without a mid-point, is that agents will come to believe that the authorities are content with inflation at its upper limit: the range becomes a 'range of indifference'.

The United Kingdom's new inflation target aims explicitly at inflation of 2½% or less. It thus makes clear the *ex ante* focus for forward-looking monetary policy decisions. Making the point target for inflation fully transparent should prevent inflation expectations becoming lodged at the upper end of a range—provided monetary policy is expected to be aimed at achieving this target.

Width of a range

Although the focus for monetary policy decisions should clearly be the inflation target mid-point, hitting this mid-point exactly is very unlikely because of the uncertainties which surround any forward-looking inflation assessment. For this reason, ranges have a role to play. They offer a means of quantifying the likely variation in inflation outturns arising as a result of uncertainties. For example, a range of *x*% might be specified, which was expected to encompass *y*% of the likely variation in inflation outcomes. In this way, ranges serve a monitoring or transparency role: they inform private sector agents of the probable range of inflation outcomes—even when monetary policy is consistently well-directed—so that deviant outturns are not immediately interpreted as inflationary surprises.

In choosing an appropriate range, there is a trade-off between credibility and flexibility. A narrow range improves policy credibility, by helping to pin down the price expectations of private sector agents and the inflation preferences of the monetary authorities. But it does so at the expense of flexibility. There is less latitude for inflation to fluctuate as the economy is buffeted by shocks. And a narrow band may therefore carry a credibility cost, if target ranges are breached too frequently.

Clearly, a key factor affecting the appropriate width of the range is the degree of uncertainty regarding the target variable. This determines the likelihood that a given range will be breached. There are many sources of such

(1) See Summers, L H (1991), 'How should long-term monetary policy be determined?', *Journal of Money, Credit and Banking*, *23*, pages 625–31.
(2) Downward nominal rigidities may disappear in a low-inflation regime, however, in which case there is no reason then to expect the short-run Phillips curve to flatten at low rates of inflation. New Keynesian models are unclear about which of these scenarios is more likely.
(3) See, for example, Lebow, D E, Roberts, J M and Stockton, D J (1992), 'Economic performance under price stability', *United States Board of Governors of the Federal Reserve System, Working Paper No 125*, for the United States; Crawford, A and Dupasquier, C (1994), 'Can inflation serve as a lubricant for market equilibrium?', in *Economic Behaviour and Policy Choice Under Price Stability*, Bank of Canada, for Canada; and Yates *(op. cit.)*, for the United Kingdom.
(4) See Crawford, A (1993), 'Measurement biases in the Canadian CPI', *Technical Report No 64*, Bank of Canada.

uncertainty: unpredictable macroeconomic shocks; uncertainty surrounding the empirically estimated model of the economy; and the 'long and variable lags' in the effects of monetary policy changes upon prices. Quantifying these uncertainties is difficult.

Historical experience can offer some guide. In the past, a range of two to three percentage points—the typical range of an inflation target—would have been insufficient to encompass inflation uncertainties in the United Kingdom with even a 50% probability. Nor have such uncertainties been unique to the United Kingdom. A two percentage point range (around its mean value) would have covered only around a half of inflation outcomes in Germany in the period since the Bundesbank was set up in 1957. Forecast errors—in the United Kingdom and elsewhere—also point towards a fairly substantial lump of inflation uncertainty.

But this historical experience was, of course, in part the product of the authorities' prevailing inflation preferences. If the authorities' preferences are now for lower inflation, then history may be an unreliable guide to the future. Counterfactual simulations studies can go some way towards overcoming this problem, by 're-running history' under the assumption that an inflation-target regime had been in place throughout the period. But simulation studies such as these, if anything, add weight to the view that existing band widths may accommodate inflation uncertainties less than fully.(1)

All of this evidence presupposes that unpredictable shocks to the economy in the past are a good guide to those in the future. This may not be the case. A low-inflation regime may itself help dampen inflation uncertainties. For example, there is a large body of empirical evidence which suggests that inflation variability may be lower at low rates of inflation. And having guided inflation down to within its 0%–2% range, the authorities in New Zealand have largely succeeded in keeping inflation within this range over the past two or three years. The monetary policy framework in New Zealand—as in all other inflation-target countries—is, however, yet to be tested over a full cycle. So experience of operating within a low-inflation environment is too limited to be conclusive about the extent of likely inflation uncertainties.

Among inflation-target countries, there are clear differences of view on the appropriate width of the range. These are reflected in operational practice: some (Australia, Finland and Spain, for example) have opted for point targets or upper limits; some (including Canada, Israel and New Zealand) for target bands; and others (Sweden and the United Kingdom) for a target with a range around it.

Band width clearly cannot be viewed in isolation from other aspects of inflation target design. A wide range is a possible alternative to including exemptions in the inflation target. And both band width and exemptions are possible alternatives to fixing the inflation objective over a longer horizon, which would allow the short-run effect of temporary shocks to wash away. So, for example, Canada excludes volatile components from its operational target and New Zealand has caveats for certain shocks, both of which permit a narrower range. At the other end of the spectrum, France and Germany have no ranges or exemptions, but define their inflation objectives over a sufficiently lengthy—medium-term—horizon that the effect of temporary shocks can average out.

Inflation or price-level targets?

Against the inflationary backdrop of the 1970s and 1980s, the notion of targeting a price *level*—rather than a rate of inflation—seems rather fanciful. But those decades were not typical. The level of the UK RPI has *fallen* in almost a third of the years since 1800—despite having fallen in only one since the Great Depression.(2) Moreover, for much the greater part of the last century the United Kingdom and other countries adhered to a fixed exchange rate regime—a regime which *de facto* imposes a price-level target if the anchor currency country is targeting zero inflation on average. Recently, work at the Bank of Canada has revived interest in price-level targeting.(3) This and other research suggests a number of advantages and disadvantages of price-level targets.

The major benefit is reduced low-frequency, long-run uncertainty about the future price level. All shocks to the price level are (eventually) reversed—rather than accommodated—under a price level target, eliminating 'base drift'. Inflation targets, by contrast, accommodate one-off price shocks, introducing a trend into the price level: there is 'base drift'. As a result, with an inflation target uncertainty about the price level builds up over time.

As an example of the scale of this, simulations of the UK economy (covering the period between 1960 and 1994) suggest that inflation targets would increase price-level uncertainty by a factor of at least four compared with a price-level target. Such price-level uncertainty might be thought especially harmful to those entering into longer-term, non-indexed contracts—for example, by inducing front-end loading of debt repayments. And more generally, it would clearly undermine money's role as a unit of account—and so impose an external cost on all users of the currency.

The major costs of price-level targeting seem to be twofold. First, it leads to greater high-frequency, short-run inflation variability. This can be seen intuitively from the fact that, with a price-level target, every bout of above-target inflation

(1) See Fillion, J-F and Tetlow, R (1994), 'Zero-inflation or price level targeting? Some answers from stochastic simulation on a small open-economy macro model', in *Economic behaviour and policy choice under price stability*, Bank of Canada, for Canada; Debelle, G and Stevens, G (1995), 'Monetary policy goals for inflation in Australia', *mimeo*, Reserve Bank of Australia, for Australia; and Haldane, A G and Salmon, C K (1995), 'Three issues on inflation targets', *mimeo*, Bank of England, for the United Kingdom.
(2) Price indices for the last century are not comparable with today's retail prices index, however.
(3) See Fillion and Tetlow *(op. cit.)*, Duguay, P (1994), 'Some thoughts on price stability versus zero inflation', *mimeo*, Bank of Canada, for some Canadian evidence; and Lebow *et al (op. cit.)* for the United States. The Bank has also done some preliminary work in this area: see Haldane and Salmon *(op. cit.)*.

needs to be counterbalanced by a bout of below-target inflation at a later date. Estimates for the United Kingdom suggest that a price-level target may more than double the variability of year-to-year price-level changes compared with an inflation target.(1)

Second, price-level targets may heighten output variability. In the event of an adverse supply shock, for example, the aim with a price-level target is to offset—rather than accommodate—the shock by disinflating the economy. And this may in turn have an output cost, which will supplement the negative effect on output of the initial shock. Inflation targeting, by contrast, accommodates some of the price shock, resulting in fewer output costs.

The choice is therefore between low-frequency price-level uncertainty on the one hand, and high-frequency variability in inflation—and perhaps output—on the other. The relative cost of these outcomes then determines the choice between price-level and inflation targets. Unfortunately, theory and empirical evidence are largely mute when it comes to quantifying such costs. Resolution of this issue again calls for further research on the costs of inflation.

Among the conference representatives, most viewed price-level targets as a distant possibility. Inflation targets were a possible staging-post. But whether countries ended up with a price-level target would first depend on their experiences with an inflation target; at the moment, it was too early to say. Unlike the adoption of inflation targets, price-level targets could be approached gradually in the light of experience. For example, the policy weight given to correcting deviations of the price level from its target could be increased slowly through time. In that way, the likely costs of adhering to a price-level target—short-run output and inflation variability—would be ameliorated.

Conclusions

Inflation targets pose a new set of issues for those countries pursuing them—some conceptual, others technical. They also increase the focus on a number of rather older issues. Foremost among these is finding a definition of price stability that is both theoretically meaningful and operationally workable. For countries with inflation targets, this definitional issue is central. They need to supplement the working definition suggested by Federal Reserve Chairman, Alan Greenspan—that ‘price stability means that expected changes in the average price level are small enough and gradual enough that they do not materially enter business and household decisions’—to produce a concept that is sufficiently precise that it can form the basis for monetary policy actions month by month and quarter by quarter.

The inflation-targets conference was a useful step towards clarifying some of these issues. No central bank has yet settled on a definitive statement of price stability—though some have made real progress towards pinning it down. It is encouraging to see that there are many clear similarities in the mechanics of monetary policy implementation across inflation-target countries—and, probably, more widely: the increased focus on the need to form a forward-looking inflation assessment is a notable common theme. Yet at the same time, it was accepted that the true tests of the new frameworks lie ahead.

(1) See also Fischer, S (1994), ‘Modern central banking’, in Capie, F, Goodhart, C A E, Fischer, S and Schnadt, N, *The future of central banking*, Cambridge University Press.

The housing market and the economy

By Joanne Cutler of the Bank's Structural Economic Analysis Division.

Recent developments in the housing market have prompted increased interest in its links with the wider economy. After summarising the historical trends in the UK housing market—compared with those in other major industrial countries—over the past 50 years, this article looks at those links in recent years, and discusses a number of differing explanations of them. It also considers how the relationship might be affected by an environment of sustained low inflation.

Introduction

The changing price trends in the UK housing market—particularly over the past decade—have stimulated interest recently in the links between house prices and the economy as a whole. House price movements are an important element in several of the alternative explanations of the consumer boom in the 1980s. And the falls in housing wealth brought about by falling prices in the past five years have been seen by some as a reason for the weakness of consumer spending.

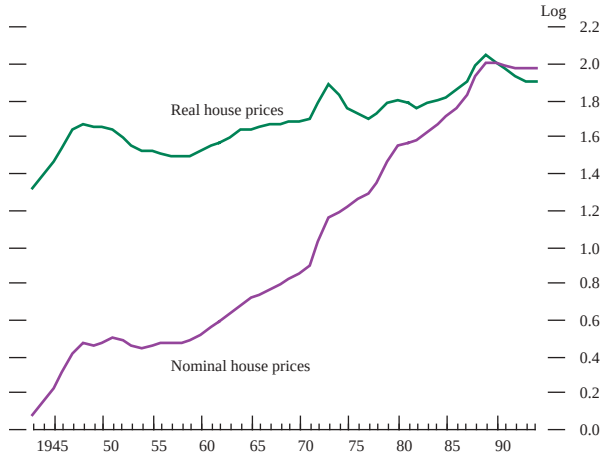
This article focuses on price developments in the housing market (looking at housing finance only indirectly) and mainly on the owner-occupied sector. It looks at the links between house price movements and the economy generally, and considers how the two might interact in the second half of the 1990s. It concludes that the simultaneous boom in house prices and consumption in the second half of the 1980s should not be interpreted as evidence of a causal link between the two. Other developments in the 1980s may have caused them to move together: in particular, the liberalisation of credit and mortgage markets allowed households to raise their demand for both housing and other goods by increasing their borrowing. Their *willingness* to borrow is likely to have been influenced by, among other factors, rising expectations about the prospects for income growth, generated by an above-trend growth rate in the economy as a whole.

A more stable macroeconomic environment in the 1990s—with lower and less volatile general price inflation—is likely to reduce the demand for housing as a hedge against inflation. In addition, the experience of nominal house price falls in the early part of this decade and the possibility that, in a low-inflation environment, such falls might recur in the future may have raised the perceived scale of the risks of investing in housing relative to other assets. And other factors, such as demographic changes, are not likely to provide much of a stimulus to housing demand in the 1990s. These developments point to a possible change in the balance of the incentives to house purchase in future, with greater importance being given to the shelter and other services that houses provide, and less to the financial return from ownership.

Trends in house prices over recent decades

Historical trends in UK house prices provide a context for the recent developments. Since the early 1940s, the trend in house prices has been steadily upward, with two exceptions—in the first half of the 1950s and the beginning of the 1990s. Adjusted for general inflation, house prices rose fourfold between 1943 and 1994, at an average annual rate of 2.7% (see Chart 1).(1)

Chart 1
Trends in real(a) and nominal house prices



(a) Department of the Environment nominal house prices deflated by RPIX inflation.

There has been a similar upward trend in real house prices in other countries (see Table A). Between 1970 and 1992, house prices relative to consumer prices rose by an average of 1.6% a year in the Group of Seven (G7) countries. Among the G7 countries, the United Kingdom and Japan experienced the fastest average real rates of house price growth.

(1) Because of improvements in the quality of the housing stock, this simple calculation exaggerates the rise in real house prices, especially before 1968 when the Department of the Environment house price index began to be weighted for a constant mix of dwellings—by type, size (number of rooms) and age. According to one estimate, the rate adjusted for the improvement in quality was around 2.5% per year. See Holmans, A E, 'House prices: changes through time at national and sub-national level', *Government Economic Service Working Paper No 110*, January 1990.

Table A
House prices[a] and income in G7 countries, 1970–92

Annual percentage changes; *per cent in italics*

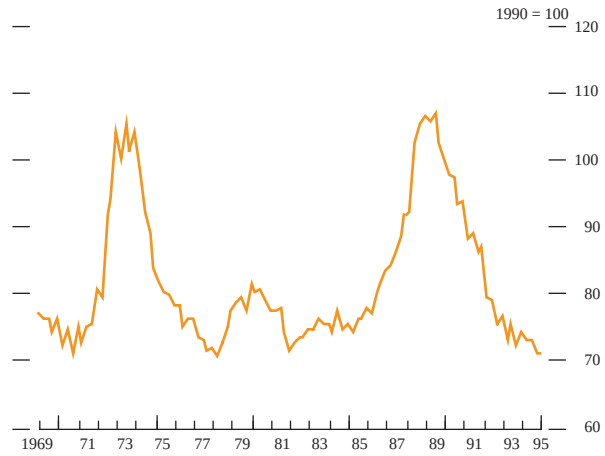
	Nominal house prices	Real house prices	Real personal disposable income (b)	Rate of owner occupation (1990)
Canada	8.8	2.0	3.4	*63*
France	6.7	0.9	2.4	*54*
Germany	5.4	1.6	2.7	*40*
Italy	12.5	0.3	2.3	*67*
Japan	7.8	2.5	3.6	*60*
United Kingdom	12.6	2.6	2.2	*67*
United States	7.7	1.6	2.5	*64*
G7 average	8.8	1.6	2.7	*59*

Sources: Bank for International Settlements (BIS), except for United Kingdom (Department of the Environment house price data deflated by RPIX) and Italy [from Holmans, A E, 'House prices, land prices, the housing market and house purchase debt in the UK and other countries', *Economic Modelling*, 1994].

(a) For the period 1970–92, except for France (1980–92), Germany (1971–92) and Italy (1970–89).
(b) Personal disposable income deflated by the consumer price index for the period 1970–92, except for France (1972–92) and Japan (1970–88).

In the United Kingdom, house prices have also risen faster than incomes, on average; by contrast, in other G7 countries, the growth in incomes has been significantly higher than that of house prices. There have been several sharp cyclical fluctuations in house prices relative to income in the United Kingdom—in the early to mid-1970s; the late 1970s/early 1980s; and the late 1980s/early 1990s (see Chart 2).

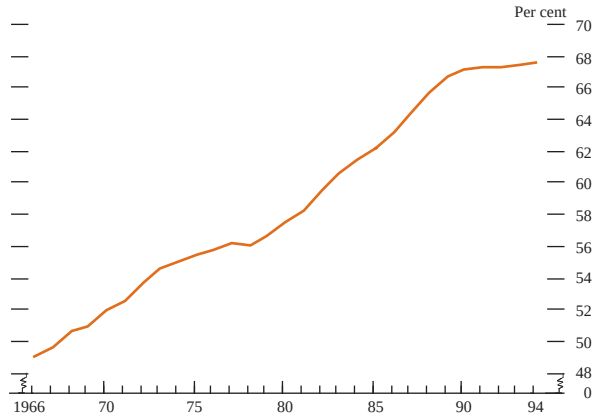
Chart 2
Ratio of house prices to personal disposable income in the United Kingdom[a]



(a) Department of the Environment house prices (1990 = 100) divided by total disposable income (1990 = 100).

The upward trend in house prices relative to consumer prices is explained by a combination of steadily rising demand for owner-occupied housing—as a result of rising *per capita* real incomes and an increasing population, combined with the greater availability of mortgage finance and tax advantages favouring homeownership[1]—and a relatively inelastic supply of new dwellings because of the limited supply of land. Since the 1950s, the share of households that are owner-occupiers has increased from under a third to more than two thirds (see Chart 3), as the importance of the private and (more recently) the public rented sectors have declined.

Chart 3
Owner-occupied dwellings as a proportion of housing stock



Source: Department of the Environment.

Although tax incentives in favour of owner-occupation are common in other countries, they were particularly large during the period in the United Kingdom (though they have recently been diminished) and the United States;[2] owner-occupation rates in these countries are among the highest in the G7 countries (see Table A).

One possible explanation for the sharp cyclical fluctuations in real house prices is that they are asset prices. Theoretical models which treat housing as an investment asset providing a stream of services suggest that changes in expectations can cause house prices to move sharply, as new information about changes in the future supply or demand for housing is quickly reflected in current house prices.[3]

The 1980s housing-market boom and the wider economy

The house-price boom in the second half of the 1980s was larger (relative to RPIX inflation) and longer-lasting than that of the early 1970s. Moreover, it immediately followed a smaller boom in prices in the early 1980s (1982–84), with the result that house prices doubled relative to retail prices between 1982–89.

Table B
A comparison of house-price booms

Percentage changes from trough to peak; *annual average change in italics*

Period	House prices		Real personal disposable income (a)
	Nominal	Real (a)	
Early 1970s (1971 Q2–1973 Q3)	97 *35.3*	68 *25.8*	15 *6.2*
Late 1970s (1978 Q2–1980 Q3)	68 *25.9*	25 *10.2*	9 *4.1*
Late 1980s (1985 Q1–1989 Q3)	119 *19.0*	79 *13.7*	24 *4.9*
1980s overall (1982 Q1–1989 Q3)	190 *15.2*	103 *9.9*	35 *4.1*

Sources: Department of the Environment house price index and Bank of England.

(a) Deflated by RPIX.

(1) Owner-occupied housing is exempt from capital gains tax and is eligible for tax relief on mortgage interest payments (MIRAS). Since August 1983, tax relief has been available only up to a ceiling of £30,000, and in April 1995 the rate at which relief is given was reduced from 20% to 15%.
(2) See 'Housing finance—an international perspective', in the February 1991 *Quarterly Bulletin*.
(3) See Breedon, F J and Joyce, M A S, 'House prices, arrears and possessions: A three equation model for the UK', *Bank of England Working Paper No 14*, June 1993.

Other countries also experienced an exceptional increase in house prices relative to consumer prices during the second half of the 1980s, but among the G7 countries the overall increase in real house prices between 1985–90 in the United Kingdom was second only to that in Japan (see Table C).

Table C
Real house prices[a] in G7 countries

Percentage changes; *annual average percentage changes in italics*

	1985–90		1970–92 (b)	
	Total	Annual rate	Total	Annual rate
Canada	42	*7.2*	56	*2.0*
France	22	*4.1*	11	*0.9*
Germany	4	*0.8*	39	*1.6*
Italy	5	*1.2*	6	*0.3*
Japan	76	*12.0*	73	*2.5*
United Kingdom	55	*9.2*	178	*2.6*
United States	8	*1.5*	41	*1.6*
G7 average	30	*5.1*	58	*1.6*

Sources: Bank for International Settlements (BIS), except for United Kingdom (Department of the Environment house price data deflated by RPIX) and Italy [from Holmans, A E, 'House prices, land prices, the housing market and house purchase debt in the UK and other countries', *Economic Modelling*, 1994].

(a) Deflated by consumer price indices.
(b) Except for France (1980–92), Germany (1971–92) and Italy (1970–89).

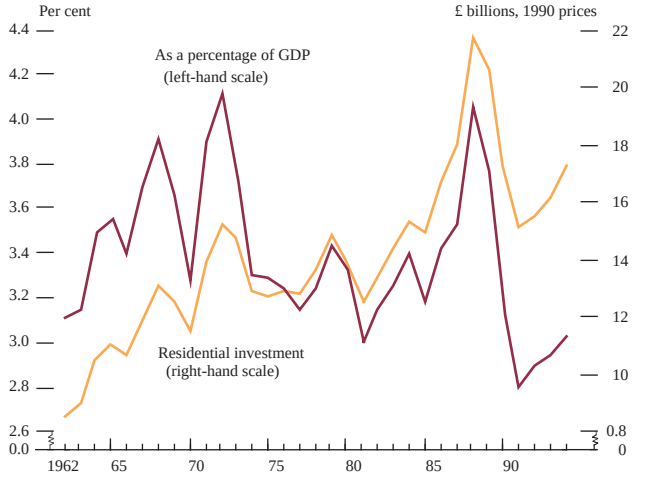
The volume of housing transactions in the United Kingdom—as measured using the number of particulars delivered to land registries—also picked up sharply: it rose from 1.2 million in 1981 to a peak of around 2 million in 1988; and, as a proportion of the total housing stock, from 12% to 16% (see Chart 4).(1)

Chart 4
Volume of property transactions

Sources: CSO, Department of the Environment.

The increase in housing demand stimulated an increase in new house building and in improvement work. At the height of the boom, between 1985 and 1988, the value of private sector residential investment (at constant 1990 prices) increased at an average rate of over 13% a year to reach around £22 billion; its share of GDP rose from 3.2% to 4.0% (see Chart 5). Although the number of new private sector housing starts in 1988 was much the same as in 1972—at the time of the previous peak in residential investment—there was much more home improvement work in the late 1980s.

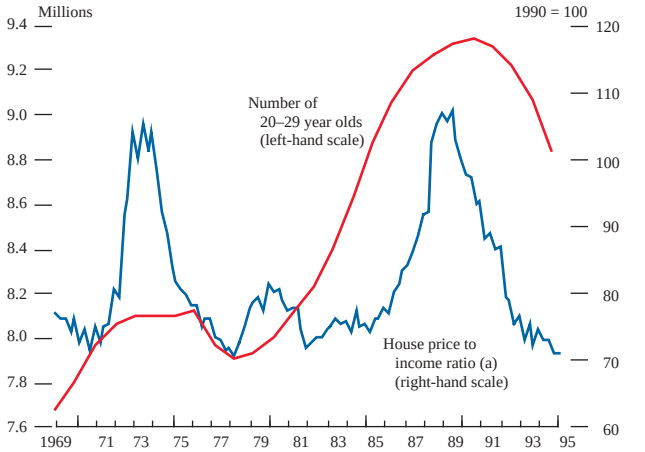
Chart 5
Private sector residential investment



Source: CSO.

There has been some debate about the relative importance of demographic factors, income expectations and financial liberalisation in generating the 1980s housing-market boom. It is likely that demographic pressures played an important role. The population in the 20–29 age range rose by 1.3 million, compared with 0.1 million over the previous decade (see Chart 6). The rate of household formation also increased: first-time buyers brought forward their entry into the owner-occupied sector as house price inflation rose.(2) Purchases were also brought forward in response to the announcement in March 1988 that from August of that year mortgage interest tax relief would be restricted to £30,000 per residence regardless of the number of borrowers; in the five months after the announcement, the number of transactions was 12,000 a month higher than in the previous five months. Interestingly, although the number of first-time buyers (excluding public sector sitting tenants) increased from 371,000 in 1982 to 545,000 in 1988,(3) their share in all

Chart 6
Number of 20–29 year olds and house price to income ratio



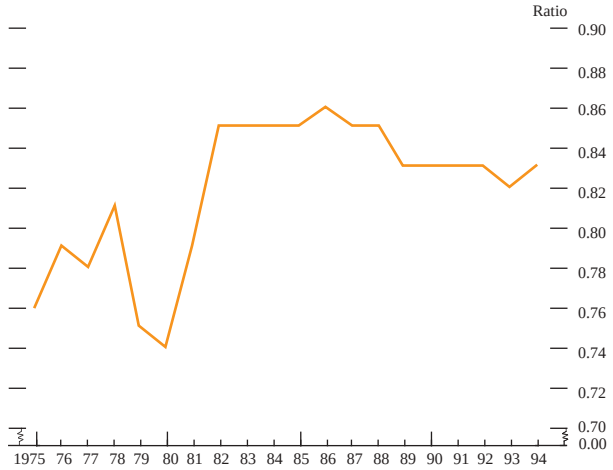
(a) Department of the Environment house prices (1990 = 100) divided by total disposable income (1990 = 100).

(1) All housing transactions in England and Wales must be recorded at land registries; residential property transactions are estimated to account for about 91% of particulars delivered.
(2) The rate of household formation may be endogenous to house prices. On this point, see for example, Dicks, M J, 'A Simple Model of the Housing Market', *Bank of England Discussion Paper No 49*, May 1990.
(3) Estimates by Alan Holmans in 'Where have all the first-time buyers gone?', *Council of Mortgage Lenders Housing Finance*, February 1995.

transactions fell, because the number of existing owner-occupiers trading rose even faster.

Financial liberalisation is also likely to have contributed to higher housing demand in the 1980s. Prior to that decade, mortgages were rationed. So there was a distinction between the *notional* demand for owner-occupied housing—the level of demand that would have been present had potential buyers been able to obtain the necessary finance at an acceptable cost—and the *effective*, or actual, level of demand. Following the abolition of restrictions on bank lending in 1980, which enabled banks to compete with building societies in the mortgage market, and from 1983 the ending of the Recommended Rates System (which kept interest rates at too high a level to clear the market) and the granting of permission to building societies to pay interest gross (which gave them access to the wholesale money markets), rationing disappeared. As a result, the average loan-to-value ratio for first-time buyers rose from 0.74 in 1980 to 0.86 in the mid-1980s (see Chart 7).

Chart 7
Average loan-to-value ratio for first-time buyers

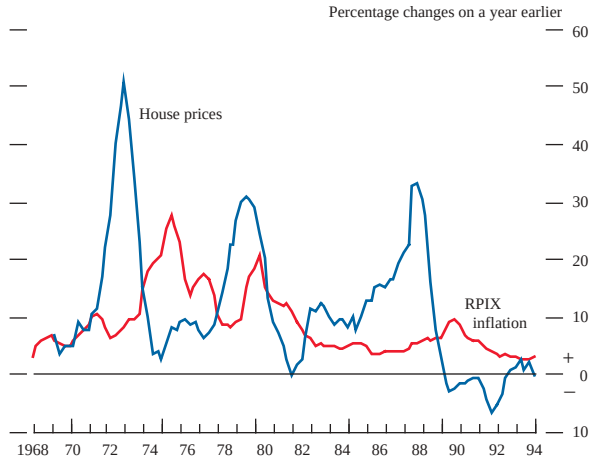


Source: Department of the Environment.

But the fact that the main boom in house prices came several years *after* the deregulation of mortgage markets suggests that other factors also played a major part in generating the increase in housing demand between 1986 and 1989. In particular, rising household expectations about their future income—at a time of strong economic growth—are likely to have increased the demand for housing and the pressure on house prices.

The coincidence of the booms in house prices and the wider economy in the second half of the 1980s has stimulated interest in the *channels* linking house price movements and the general economy—via consumption, investment and inflation. The relationship between house-price and general inflation is shown in Chart 8. Periods of high general inflation have tended to be preceded by rapid increases in

Chart 8
House prices and general inflation



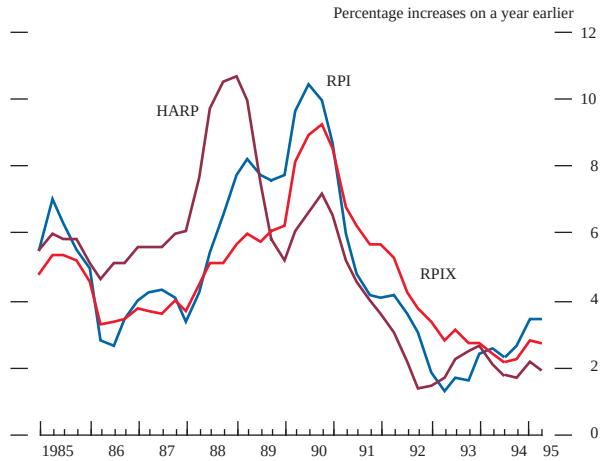
Sources: Department of the Environment and CSO.

house prices, although the relationship has not been a stable one.

There are, of course, some mechanical links between house prices and general inflation, because the retail prices index (RPI) includes the shelter costs of owner-occupiers in the form of mortgage interest payments(1) and a depreciation component.(2) The Bank also publishes a housing-adjusted retail prices (HARP) index, which includes not only depreciation and other running costs, but also the opportunity costs of money tied up in housing that could be invested in an interest-bearing asset. A further refinement to the HARP index strips out the effect of indirect taxes on inflation—the tax and housing adjusted retail prices, or THARP, index.

But there is also a less direct relationship between house prices and general inflation, because house prices can act as a *signal* about demand and price pressures in the wider economy. One reason for this is that house prices and consumption, for example, tend to be influenced by many of

Chart 9
Measures of inflation

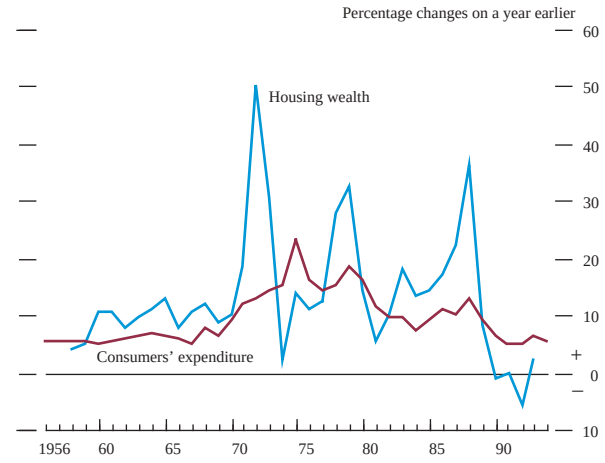


(1) The inclusion of mortgage interest payments has the perverse effect that when interest rates are increased to combat inflationary pressure, and mortgage rates rise, inflation will (temporarily) increase. That is why the Government's target—RPIX—measure of inflation excludes mortgage interest payments.
(2) The latter was introduced in February of this year, on the recommendation of the RPI Advisory Committee, in order to reflect the costs of homeownership more accurately in the measured cost of living (see the box on page 8 of the February 1995 *Inflation Report*).

the same factors—and in particular by household expectations about their future income. But, as asset prices, house prices can be expected to reflect shifts in expectations more quickly than consumer prices. In this way, the house-price boom in the 1980s might have provided a warning of the pick-up in consumption and inflationary pressure (see Chart 9).(1)

Some economists have argued that there are *causal* links between changes in real house prices and consumption, which operate via changes in housing wealth. This argument is grounded in the life-cycle model of consumption, according to which consumer spending will depend not only on current income but also on the present discounted sum of expected income, or 'lifetime wealth'—provided individuals can borrow. The evidence often cited in support of this view is the importance of housing wealth in personal sector wealth, and the simultaneous rise in housing wealth and consumption in the second half of the 1980s (see Chart 10).

Chart 10
Changes in housing wealth and consumers' expenditure



Source: CSO Blue Book.

However, as suggested above, it is not clear how house price increases can *cause* consumption to rise since, in a general equilibrium framework, they are jointly determined (ie they are 'endogenous'). In other words, changes in house prices (and housing wealth) cannot be considered in isolation from developments in the rest of the economy and, more often than not, they reflect—or act as a signal of—those developments.

Moreover, at an *aggregate* level, the effects on consumption of changes in wealth are debatable. The price of a house can be understood as the present discounted sum of the value of housing services derived from it, as measured by the user-cost of housing.(2) When house prices rise, as long as homeowners continue to demand the same quantity of housing services, they are not in any real sense better off. Homeowners could, of course, choose to 'trade down' to realise their gains, but for each person trading down there will be one trading up.(3) So when real house prices rise, there will be 'winners'—last-time sellers, or those who trade down—and 'losers'—first-time buyers and those who trade up. This argument suggests that the *aggregate* effects on consumption of a change in house prices would not be large.(4)

Moreover from a microeconomic perspective, the effect of rising house prices on consumers' spending is not

Equity withdrawal

Equity withdrawal from the housing market can be defined as the difference between increases in housing market liabilities (ie mortgage loans) and housing assets (ie new building and improvement work, net of depreciation and slum clearance). Some estimates of equity withdrawal are given in the table below. Homeowners' ability to use the positive equity in their homes to extend their mortgages provides one possible channel through which changes in house prices can influence consumption.

Value of equity withdrawal from the housing market(a)

£ billions; *as a percentage of real disposable income in italics*

	Net new loans for house purchase *a*	Investment in new dwellings *b*	Other investment *c*	Equity withdrawal *d = a-b-c*	Real equity withdrawal (b)	
1965–69	0.8	1.0	0.1	-0.3	-2.1	*-1.0*
1970–79	3.2	2.7	0.2	0.2	0.8	*0.3*
1980–89	21.1	10.8	2.9	7.5	9.5	*3.1*
1990–94	23.0	16.8	3.4	2.8	2.9	*0.8*

Source: Bank of England.

(a) All figures are annual averages.
(b) Deflated by RPIX.

In the 1980s, the annual amount of equity withdrawal (at 1990 prices) was more than ten times higher than in the previous decade, at £9.5 billion compared with £0.8 billion in the 1970s; as a proportion of real disposable income, it was 3.1% compared with 0.3%.

The substantial increase in equity withdrawal in the 1980s in part reflected a one-off adjustment by the personal sector to higher debt levels as borrowing constraints were eased. The average ratio of debt to income in the personal sector rose from 0.57 in 1980 to 1.17 in 1990; within this total, mortgage debt rose as a share of total personal sector debt, because it provided a cheaper means of borrowing than consumer credit. The increased scope for equity withdrawal is likely to have made consumers' expenditure permanently more sensitive to changes in average house prices than in the past.

(1) See the minority report by Sir Samuel Brittan (1995) on the RPI Advisory Committee's recommendations on housing costs.
(2) This is similar to the idea of a share price being the present discounted sum of the stream of expected future dividend payments.
(3) The population cannot trade down *en masse*, unless the whole of the housing stock is sold off to overseas buyers; even then, it would still need to be rented back.
(4) See Fisher, P G, 'Housing and consumption in the United Kingdom', in *Changes in the business cycle and the implications for monetary policy*, BIS, April 1993.

straightforward either. The *income effect* from a rise in the price of housing is negative: homeowners can afford less of both housing and other consumer goods. But, in theory, this negative income effect on consumption might be offset by a positive *substitution effect*—as homeowners substitute away from housing, whose relative price has risen, towards goods and services whose relative prices have fallen. In practice, however, the demand for housing is fairly inelastic and the substitution effect is likely to be small.

There may, however, be another channel from increases in house prices to consumption, involving collateral rather than wealth. Muellbauer and Murphy(1) have emphasised the role that financial liberalisation played in the transmission of the house-price boom to the wider economy in the mid-1980s, by enabling homeowners to borrow against the (rising) collateral provided by their homes. (The box on page 264 explains equity withdrawal in more detail.) It could be added that the *willingness* of homeowners to borrow is likely to have been influenced by, among other things, rising expectations of future income: it is generally easiest and cheapest to borrow by extending a mortgage, which is *secured* borrowing.

The 1990s to date

The downturn in the housing market has resulted in unusual (but not unprecedented) falls in nominal house prices; since 1989 Q3, prices have fallen by around 12%. The falls were, in part, a reflection of lower general inflation than in past downturns, when higher general inflation allowed real house prices to fall while nominal house prices continued to rise. Between 1973 Q3 and 1978 Q2, house prices rose by 43%, but nevertheless relative to RPIX fell by around 35%; but between 1989 Q3 and 1995 Q1, a similar fall in real house prices required an 12% fall in house prices (see Table D).

Table D
A comparison of UK real house price downturns

Percentage changes from peak to trough; *annual average changes in italics*

	House prices	Retail price index excluding mortgage interest payments	Real house prices (a)	Real personal disposable income
Mid 1970s	43	121	-35	-3
(1973 Q3–1978 Q2)	*7.8*	*18.2*	*-8.8*	*-0.7*
Early 1980s	—	16	-13	-2
(1980 Q3–1982 Q1)	*0.2*	*10.1*	*-9.0*	*-1.3*
Early 1990s	-12	28	-31	7
(1989 Q3–1995 Q1)	*-2.2*	*4.7*	*-6.6*	*1.3*

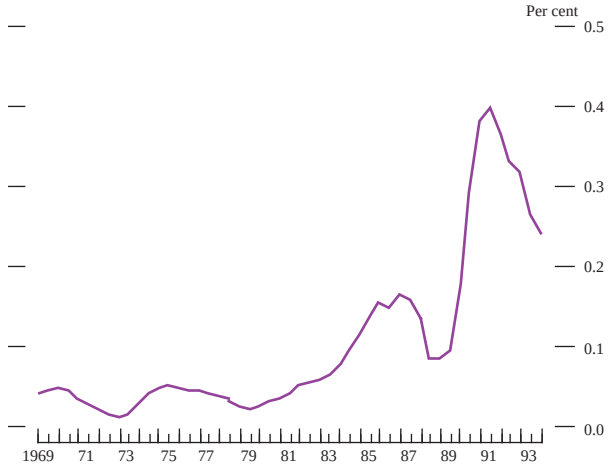
Sources: Department of the Environment house price index and *Economic Trends.*

(a) Deflated by RPIX inflation.

There have been similar occasional falls in other countries. All of the 15 countries covered in a recent BIS study(2) had experienced a nominal house price fall of 7% or more during some period between 1970 and 1992. In seven cases (including the United Kingdom), the falls had been in excess of 10%; Finland and the Netherlands had both experienced a fall exceeding 30%.

For a large number of UK households, the fall in house prices resulted in the value of their properties falling below the size of their outstanding mortgages—the problem of *negative equity*. The appearance of negative equity on a significant scale may have raised the perceived risks of capital losses from owner-occupation. It has also made homeowners with difficulties in meeting mortgage payments more vulnerable to possession.(3) Between the second half of 1989 and 1991, mortgage possessions rose as a proportion of all mortgages from 0.09% to 0.4% (see Chart 11).

Chart 11
Possessions as a proportion of total mortgages



Source: Council of Mortgage Lenders.

In some cases, negative equity is likely to have reduced households' ability or willingness to move for job-related reasons, thereby lowering labour mobility. It may also help to explain the sharp fall in housing-market transactions between 1990 and 1994; last year's volume of about 1.2 million was three quarters of the average level during the 1980s. As a proportion of the owner-occupied housing stock, transactions were around 9%, compared with an average of 12% in the 1960s and 1970s (see Table E).

Table E
Housing market turnover

Percentages in italics

	Level ('000s) (a)	Change	As percentage of owner-occupied housing stock
1960–69	870	. .	*11.3* (b)
1970–79	1,100	*26*	*11.9*
1980–89	1,530	*39*	*13.2*
1990–94	1,150	*-25*	*8.6*

Sources: Department of the Environment and Inland Revenue.

. . not available.

(a) Estimated as 91% of the number of particulars delivered in *all* property transactions.
(b) 1966–69.

A number of links have been suggested between the downturn in the housing market and the general state of the

(1) In Muellbauer, J and Murphy, A, 'Is the UK balance of payments sustainable?', *Economic Policy, Vol II*, 1990.
(2) Kennedy N, and Andersen, P, 'Household saving and real house prices: An international perspective', BIS, 1994.
(3) The courts take into account the amount of negative equity in exercising their discretion in applications by lenders for possession. A recent survey found that three quarters of homeowners whose houses were possessed had no positive equity in their homes: see Ford, J, Kempson, E and Wilson, M, 'Mortgage arrears and possessions: perspectives from borrowers, lenders and the courts', *Housing Research Report*, HMSO, 1995.

Negative equity and the personal sector balance sheet

Negative equity occurs when the market value of an individual's house falls below the value of the outstanding mortgage secured on it. It became widespread in the early 1990s, particularly in the South of England, as a result of a combination of falls in house prices and high levels of gearing by some participants in the housing market.

There are two reasons why negative equity has been singled out for special attention (and differentiated from other forms of personal sector debt). The first is that in some cases it reduced the ability of homeowners to move. This was particularly true in the early part of the 1990s, when lenders in general did not allow homeowners with negative equity to transfer their mortgage between properties. The second is that falling house prices in the early 1990s represented an unexpected loss of wealth. Many of those affected by negative equity had been first-time buyers only a few years earlier, when house prices had been high, and had negative net financial wealth when house prices fell. The concentration of the loss of wealth within this group probably meant that it affected consumption and savings behaviour more than it would have otherwise.

Estimates of negative equity

The amount of negative equity has been estimated in several ways. 'Snapshot' estimates for particular dates can be produced using information from household surveys. Using a different approach, Dorling of Newcastle University has produced estimates from a large sample of mortgage transactions through the Halifax Building Society.(1) These sample-based estimates require grossing up to produce aggregate estimates of negative equity for the United Kingdom as a whole.

An alternative method, which has been used by the Bank and others, starts with aggregate data on the number of loans for house purchase, average loan-to-value ratios (or deposits put down) and average house prices. The value of negative equity is calculated for various groups of buyers (defined according to the region in which they buy, first-time buyer/existing buyer status and their loan-to-value ratio). The value of a representative buyer's outstanding mortgage within each group at the time of purchase is given by the purchase price multiplied by the loan-to-value ratio. In subsequent periods, an estimate of the equity position is calculated by subtracting the remaining mortgage from the new level of house prices for that group. The groups are aggregated to produce estimates of negative equity for the United Kingdom as a whole. These estimates then need to be adjusted to make allowance for possessions (which reduce negative equity but do not eliminate the residual unsecured debt), and for further advances and arrears (which increase negative equity). The wide range of published estimates indicates the difficulty in knowing how large these adjustments should be and the serious measurement problems involved.

Problems with estimates

The assumptions necessary to calculate negative equity have been recently reviewed by the Bank, to take account of new information which has become available since the original method was first applied. Four main measurement problems have been identified:

- An inadequate adjustment for 'abnormal' (lump-sum) loan repayments made by households with negative equity (which will have reduced the value of their outstanding mortgages).
- Failure to take full account of household moves.
- Uncertainty about the adjustment for possessions, further advances and arrears which affect the level of unsecured housing debt.
- Uncertainty about property values.

Although it is fairly simple to measure the value of a typical individual's original mortgage, the amount outstanding can be reduced by loan repayments, or increased by further advances. Loan repayments can be either scheduled (for homeowners with repayment mortgages) or discretionary lump-sum repayments. Bank calculations include an adjustment for both sorts of repayment, but it is highly likely that lump-sum repayments are underrecorded. The simplifying assumption made is that households with negative equity make a lump-sum repayment each quarter in line with the average for all households, but in practice they are likely to make larger than average repayments to reduce their debt. The inaccuracies induced by this assumption are likely to have increased over time.

Second, estimates of negative equity typically do not take full account of moves by households with negative equity within the owner-occupied sector. This may result in some double-counting of the number of households affected. For example, if a household with negative equity moves and finds that the price of its new home falls, it may be counted twice. If, alternatively, the household leaves the owner-occupied sector by selling its home, it will continue to be included in the estimate of the number of households with negative equity.(2) It is not possible to make an adjustment for these effects in the absence of any information about the mobility of households with negative equity. Again, the associated inaccuracies are likely to have increased over time.

(1) Dorling, D, 'The spread of negative equity', *Housing Research Findings No 101*, Joseph Rowntree Foundation, 1993.
(2) A decision to leave the owner-occupier sector may be made to limit the household's exposure to further house price falls. An outstanding debt may remain.

Bank estimates, however, have made an allowance for the technical elimination of negative equity through possession by the lender, and for additions to negative equity through advances and arrears. The adjustment involved simply grossing up the original estimates by 15%. This is a crude assumption:[3] preliminary work based on recent survey information suggests that this adjustment biases the estimates upwards.[4]

Without further information, it is not possible to make an accurate adjustment for the factors outlined above. In particular, such adjustments are hampered by the fact that the factors are not independent of other influences on negative equity. Nonetheless, the evidence that is available tentatively suggests that making no adjustment for these factors may be better than using the 15% scaling factor. When the original method was first applied, the level of arrears was very high and the positive contribution of arrears, together with that of further advances, was thought to outweigh the negative contribution of properties taken into possession. Since then, however, the cumulative number of possessions has risen while the number of households in arrears has fallen, and recent survey evidence suggests that the effect of these factors may be approximately offsetting. Making no adjustment for arrears, possessions and further advances would reduce the estimate of the number of households with negative equity in 1995 Q2 from 1.1 million to around 925,000, and the estimated value of UK negative equity from £5.0 billion to around £4.3 billion.

Finally, there are alternative sources of data on house prices. Bank estimates of negative equity have been based on Halifax Building Society data on average house prices in each region. However, the average house prices recorded by the Department of the Environment are higher than those recorded by the Halifax (particularly in the South East) and hence produce a lower estimate of UK negative equity.

As well as these measurement problems, there is an important conceptual problem. Estimates of negative equity are a measure of the excess of housing debt over the value of housing assets or wealth. Using this to explain household spending/savings patterns represents a partial approach to the analysis of the personal sector balance sheet.

The value of financial savings accumulated by households with negative equity (including endowment policies[5]) matters for the economic interpretation, if not the technical measurement, of negative equity. From a macroeconomic viewpoint, negative equity is relevant because of its possible effects on the mobility and savings of the households affected. These effects were widely thought to be significant in the early 1990s, when negative equity first became widespread. Since then, however, some of those households that were affected by negative equity will have responded to it by increasing their savings, and to the extent that their negative equity is now matched by accumulated savings, there is no reason to think that their behaviour will any longer be affected.

There is some evidence about the recent savings behaviour of households with negative equity over and above that through endowment mortgages. According to the General Household Survey, in 1993–94 16% of households with negative equity had savings which exceeded their negative equity, and the remaining 84% had savings amounting to 14% of their negative equity. In addition, information from the annual British Household Panel Study suggests that households with negative equity in 1991 saved more than the average household between 1991 and 1993. This might also suggest that there may have been some accelerated repayments of principal.

Conclusions

The above discussion illustrates the many uncertainties surrounding published estimates of negative equity (including the Bank's). They rely on a number of very uncertain assumptions which cast doubt on their accuracy; and the inaccuracies are likely to have increased over time. There is also a major conceptual problem with using these estimates to explain household behaviour. Negative equity was thought to be important because it affected mobility and because it changed consumer spending/savings patterns. It is now several years since negative equity became widespread. During this period, there are likely to have been important behavioural changes which mean that its significance has probably diminished. As suggested above, some households will have accumulated savings which match their negative equity. Moreover, increasingly households and mortgage lenders have found ways of overcoming the constraints on mobility which negative equity had earlier created. For example, many lenders now offer schemes to enable households to transfer negative equity between properties.

Given these developments, it would clearly be unsatisfactory in current circumstances to regard negative equity as a summary indicator of housing distress. There are other indicators which deserve (at least) equal attention, for example those on arrears and possessions. That is not to suggest that negative equity is not still a problem for a substantial number of mortgage borrowers: the point is rather that it is not the *only* source of housing-related financial problems; and that some of the problems associated with negative equity have been overcome.

(3) It was based, in part, on the limited survey information available when the calculations were first undertaken.
(4) Information on arrears and possessions is provided in a household survey, commissioned by the DoE in 1994: see Ford *et al* (1995) (*op. cit.*). This found that of the buyers who had lost their homes through possession 72% had negative equity, higher than the proportion of borrowers in arrears who had negative equity, of 28%.
(5) There are penalties for the early surrender of endowment policies, but it would clearly be wrong to ignore their value completely in analysing household behaviour. As was pointed out recently, for many individuals who took out endowment mortgages in the second half of the 1980s, the growth in the surrender value of these funds would probably now be sufficient to offset their negative equity: see 'No house room for the myth of negative equity' by Anatole Kaletsky, *The Times*, 22 June 1995.

economy. For households, the weakening of the personal sector balance sheet is likely to have contributed to slower growth in consumers' expenditure in general, and the demand for household goods in particular.(1)

The weakness in the demand for housing has been associated with a sharp fall in private sector residential investment during the recession. At 1990 prices, the value of new house building almost halved from its peak in 1988, but, perhaps more unusually, there was also a dramatic decline in the value of home improvement work (see Table F). This lends some support to the view that with lower inflation, the demand for housing in its widest sense—including the quality as well as the quantity of housing—is likely to be lower. One reason for this is that there is less need for a hedge against unpredictable inflation—which housing has traditionally provided.

Table F
Private sector residential investment at 1990 prices

Percentage changes

	Value of total private sector residential investment	Value of new starts	Value of repair, maintenance and improvement work (a)
Upturns			
1977–79	16.4	4.5	40.1
1985–88	45.9	48.7	25.0
Downturns			
1972–75	-16.2	-32.2	-4.5
1979–81	-15.7	-28.4	-5.7
1988–92	-28.6	-47.5	-14.4

Source: CSO.

(a) Includes public sector—figures for private sector are not available separately before 1985.

The housing market in a low-inflation world

Sustained low inflation is likely to reduce the amplitude of the economic cycle, avoiding the damaging booms and busts which have characterised the past quarter of a century. What are the implications for the demand and price of housing, and for future fluctuations in house prices?

It is not immediately obvious that lower general inflation will affect the *real* rate of return to housing, as approximated by the user-cost of housing.(2) However, because the majority of house purchases are financed by a mortgage which is fixed in nominal terms, housing has in the past provided a hedge against high and unpredictable general inflation, and such purchases have generally yielded large amounts of positive equity. With lower and less variable inflation, the demand for housing as a hedge against inflation should fall. In addition, the reduction in the tax advantages of investing in housing has reduced its relative attraction as an asset.

But low inflation will not eliminate all fluctuations in the economy, nor will it prevent changes in relative prices of goods and services in response to changing relative supply and demand. House prices are likely to continue to be more cyclical than other prices, both because they are particularly sensitive to expectations and (in the short run, at least) housing is in fixed supply. In an environment of overall price stability, this is likely to mean that house prices will fall in some years.

To illustrate this point, since the early 1940s real house prices have risen by around 2.7% a year. But (as outlined above), there has been a wide distribution of real house price fluctuations within this: in about 60% of the years, there was a rise in real house prices; in the remainder, real house prices fell. If there were to be the same distribution of real house price changes—which reflects the distribution of underlying shocks to the housing market—in future, lower general inflation would mean that house price falls would be more common than in the past.

However, if real house price fluctuations in part reflect instability elsewhere in the economy, low inflation should lead to less volatility in real house prices. For example, the economic conditions which are conducive to low general inflation are likely to involve smaller fluctuations in real income expectations and in the induced demand for housing. If sustained low general inflation could be achieved then there would be less danger of housing-market booms in which the expectation of higher returns becomes self-fulfilling in the short run, but eventually proves unsustainable.

Low general inflation can also be expected to lead to lower and less variable interest rates, which would reduce the problem of '*front-end loading*'. Assuming real interest rates are constant, higher inflation implies higher nominal mortgage rates, which have the effect of tilting the real burden of repayments towards the earlier years of a mortgage. This can cause cash-flow problems for some households in servicing their mortgage debt.(3) Households' ability to service their debt may also be improved with a move towards smaller loans, either from a shift towards purchasing cheaper houses, or (more likely) a shift towards higher initial deposits and lower loan-to-value ratios. From the lenders' viewpoint, lower loan-to-value ratios can be expected to reduce the risk of arrears and default.

Another factor which should serve to reduce desired loan-to-value ratios is that, with lower expected returns to owning a home financed by a mortgage, households will feel less pressure to gear up in debt in order to maximise their potential return on housing investment. This will mean that

(1) There would be a positive relationship between housing-market turnover and the demand for household goods if housing and other goods were complements. They may be complements or substitutes: a higher level of housing transactions raises the demand for soft furnishings and white goods, but owners unable or unwilling to move may choose to spend money on improving their existing homes.

(2) The user-cost of housing is the post-tax cost of holding housing as an asset. At its simplest level (an individual who takes out a 100% mortgage), this is the cost of finance—given by the (post-tax) mortgage rate (1-*t*) (r_m)—minus capital gains on housing, as measured by the percentage increase in house prices (%*hp*), multiplied by the house price (*HP*). A more sophisticated measure will also take into account the way in which house purchase is financed, either through mortgage borrowing or savings. It can be written as:

$$[(1-t)\, r_m\, lvr + r\,(1-lvr) - \%hp]\, HP$$

where the additional term, *lvr*, is the loan-to-value ratio. A higher level of gearing, as measured by the loan-to-value ratio, magnifies gains and losses from house purchases financed by a mortgage. See, for example, King and Atkinson, 'Housing policy, taxation and reform', *Midland Bank Review*, 1980.

(3) In the long run, nominal incomes will rise with inflation enabling households to service the higher nominal repayments. In the short run, because the rise in nominal interest rates is designed to check future inflation, nominal incomes may not keep pace with the rise in inflation and higher nominal interest rates may cause a cash-flow problem for some households.

the demand for mortgage funds is likely to be lower, as new and existing borrowers reduce their exposure to house price fluctuations.

Summary

Fluctuations in house prices are relevant to a broader economic assessment,(1) because of the information they can contain both about household expectations and about demand and price pressures in the economy.

Developments in the housing market over the past few years—including arrears and possessions, and negative equity—have increased the perceived risks of borrowing for house purchase. In addition, lower general inflation is likely to mean that the demand for housing as a hedge will be reduced.

A climate of price stability may also lead to smaller fluctuations in real house prices, as uncertainty about the rate of return from housing is reduced; in the past, changing expectations have been an important source of volatility in real house prices. Moreover, both lenders and borrowers may shift towards lower desired loan-to-value ratios to take account of the likelihood that with lower general inflation house price falls may occur from time to time.

(1) House prices are one of the many indicators considered by the authorities in assessing the stance of monetary policy.

Company profitability and finance

By Mark Cornelius and Kieren Wright of the Bank's Structural Economic Analysis Division.

This article looks at the performance of companies in 1994 and the first quarter of 1995. Its main points include:

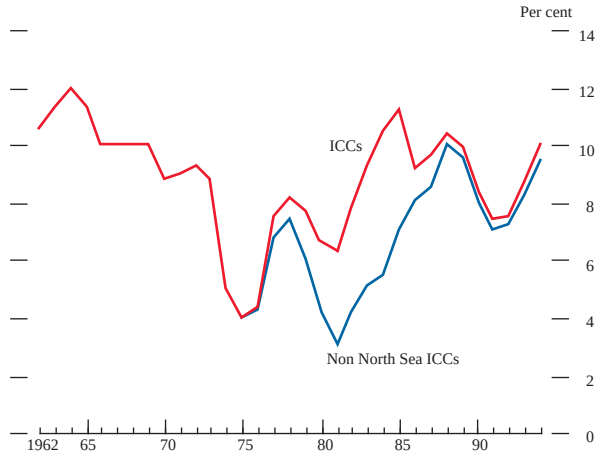
- *Company profitability outside the North Sea sector continued to improve rapidly in 1994. But figures for the first quarter of 1995 suggest that nominal profits fell compared with a quarter earlier.*
- *Industrial and commercial companies' investment fell in 1994. Investment varied markedly between industrial sectors, however. In the oil and gas and utilities sectors it fell sharply, whereas service-sector and manufacturing investment grew quite strongly. Growth in overall investment has been subdued in this recovery to date, particularly in new buildings. But most economic commentators predict that investment will strengthen this year.*
- *Spare capacity, uncertainty and the need to restructure balance sheets are possible reasons for companies' cautious expenditure on fixed assets so far.*
- *Companies increased stock levels in 1994 and at the beginning of 1995. This may have reflected a mixture of involuntary and voluntary stockbuilding.*
- *Despite large repayments of bank borrowings by companies, corporate debt has remained at relatively high levels because of continued growth in the stock of other liabilities. But income gearing is low. Recent recourse to bank borrowing may have reflected a number of factors: including the need for working capital, plans to invest and the desire to finance acquisition activity.*

Profits and profitability

The profitability of industrial and commercial companies (ICCs) outside the North Sea sector(1) continued to rise in 1994 (see Chart 1). Profitability measures the real rate of return on capital or, in other words, profits expressed as a percentage of the capital stock. Underlying these figures, nominal profit growth was higher in 1994 than in 1993 (see Table A). But data indicate that these companies' profits fell sharply in the first quarter of 1995 compared with the previous quarter.

Official data for manufacturing companies suggest that profits in that sector grew by 11% in 1994.(2) Bank estimates suggest that manufacturers' profit margins(3) on domestic sales rose in 1994 compared with a year earlier. Material costs—including semi and finished manufactured imports used in the production process—rose more quickly than domestic output prices. But unit labour costs, which account for a larger proportion of manufacturers' costs, were

Chart 1
ICCs' profitability(a)



Source: CSO.

(a) Pre-tax rate of return on capital stock at replacement cost.

(1) The usual term 'North Sea sector' is used in this article; but strictly, the sector is defined to include those companies involved in the development of new oil fields in the Atlantic.
(2) The Central Statistical Office publishes annual data for the gross operating surplus of manufacturing companies, which is gross trading profits plus rent less stock appreciation.
(3) Measured as profits per unit of output.

Table A
ICCs' income and appropriation account

£ billions (seasonally adjusted)

	1993	1994					1995
	Year	Year	Q1	Q2	Q3	Q4	Q1
Income							
Gross trading profits (a)	85.1	98.5	23.3	24.9	25.0	25.4	24.6
of which:							
non North Sea (a)	*77.0*	*88.8*	*21.3*	*21.9*	*22.6*	*23.0*	*21.8*
Rent and non-trading income (b)	12.5	13.0	3.2	3.2	3.3	3.4	3.5
Income from abroad (c)	15.7	20.2	4.2	5.2	5.5	5.4	5.0
Total income (d)	**115.8**	**135.3**	**30.8**	**33.8**	**34.9**	**35.7**	**34.5**
Allocation of income							
Dividends on ordinary and preference shares	21.8	23.4	5.0	5.8	6.1	6.5	6.8
Interest payments	21.3	20.7	5.1	5.1	5.2	5.2	5.4
Profits due abroad	5.9	8.8	1.8	2.2	2.3	2.4	2.2
UK taxes on income	12.7	13.9	2.9	3.5	3.6	3.9	3.7
Undistributed income	**54.0**	**68.5**	**16.0**	**17.2**	**17.6**	**17.7**	**16.4**

Source: CSO.

(a) Net of stock appreciation.
(b) Consists mainly of ICCs' interest receipts and rent received by property companies.
(c) Consists of income from direct investment abroad and from other overseas assets.
(d) Including stock appreciation.

unchanged on a year earlier. Domestic margins may have been squeezed in the first quarter of this year, as unit labour costs recovered and the pressure from material prices increased. Margins on exported manufactures may also have increased in 1994 compared with 1993. But in contrast to the margins on domestic sales, exporters' margins almost certainly rose in 1995 Q1, as export prices increased by almost 7% compared with the previous quarter.

Bank estimates suggest that in 1994 goods retailers' margins continued the downward trend begun in 1992. Retailers' unit labour costs have grown more slowly than retail goods inflation since 1992. But bought-in goods account for the bulk of their costs; and retailers have been unable or unwilling to pass on all of the price increases made by their suppliers.

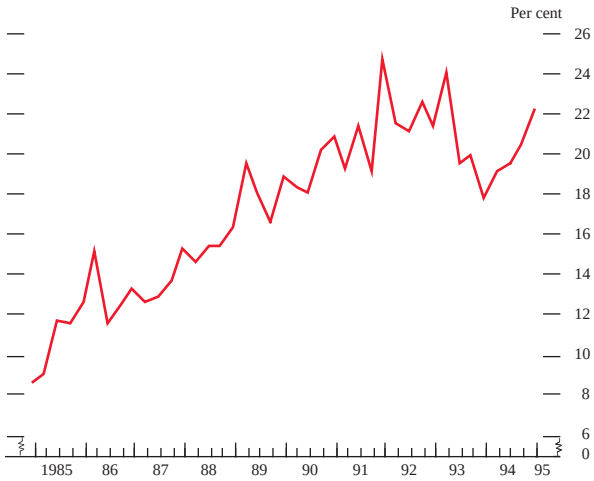
Profits from oil and gas extraction rose by 20% in 1994, some five percentage points faster than those of other ICCs. Average Brent oil prices were lower in 1994 than 1993; but oil and gas output volumes rose by 24% in 1994. This reflected the ending of maintenance programmes, which had stopped some production, and the coming on-stream of new fields. There was a further strong rise in North Sea companies' profits in 1995 Q1: output rose by 5% on the previous quarter and Brent prices also rose, by around 2%.

Income and appropriation

Gross trading profits are the largest component of ICCs' income, accounting for around three quarters in 1994 (see Table A). And profits growth was the main reason for the 17% increase in ICCs' income in 1994. But income from abroad also made an important contribution, accounting for around a quarter of total income growth. Income from abroad itself grew by about 30%; this seems to have been largely a result of stronger growth in the world economy in 1994. GDP in the major six overseas economies grew by close to 3% last year, compared with less than 1% in 1993.

Looking at the allocation of income, dividends constituted the largest item in 1994. Although in 1994 as a whole there was a fall in dividends as a proportion of ICCs' post-tax income—the dividend payout ratio—this largely reflected a particularly low first-quarter dividend figure (see Chart 2). Over the course of 1994, dividends grew extremely strongly: they were around 30% higher in the fourth quarter than at the beginning of the year. This strong growth continued in 1995 Q1: dividends increased by almost 5% compared with the previous quarter.

Chart 2
ICCs' dividend payout ratio(a)



Source: CSO.

(a) Dividends as a proportion of post-tax income.

Interest payments by ICCs fell slightly in 1994. ICCs' total annual interest paid has fallen by £11 billion since 1990; this has been largely the result of falling payments to the banking sector. It has reflected the fall in base rates; but in addition companies have been net repayers of bank lending since 1991 (see below).

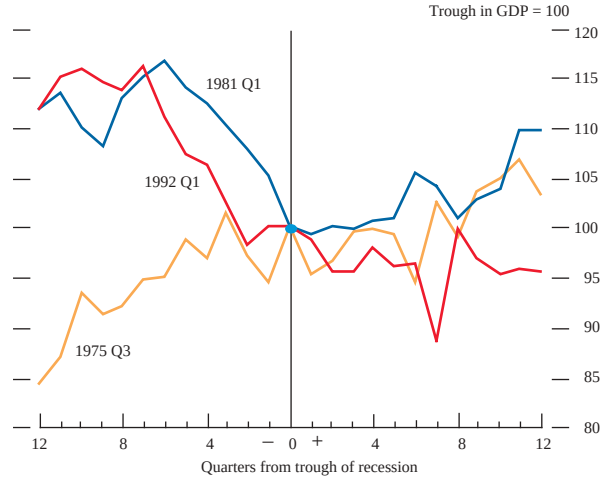
ICCs' tax payments (largely mainstream and advanced corporation tax) increased by close to 10% in 1994. There was a substantial rise in tax payments over the course of the year, which partly reflected the sharp pick-up in profits in 1993. Increases in tax payments tend to lag recoveries in profits, partly because mainstream corporation tax is payable nine months after the end of a company's accounting period. But also some firms have been able to use losses accumulated during the recession to reduce their tax liabilities in the initial phase of the upturn.

The 48% rise in profits due abroad in 1994 partly reflected the continuing rise in the stock of direct inward investment. But this accounted for only a small proportion of the increase: the stock of inward investment into the ICCs sector has only grown by about 6% in each of the past two years. The key driving force would appear to have been the performance of the underlying assets.

Capital expenditure

Measured in current prices, ICCs' investment fell by 2.6% in 1994. Indeed, it has yet to show a sustained rise during this

Chart 3
Business investment in three recoveries[a][b]



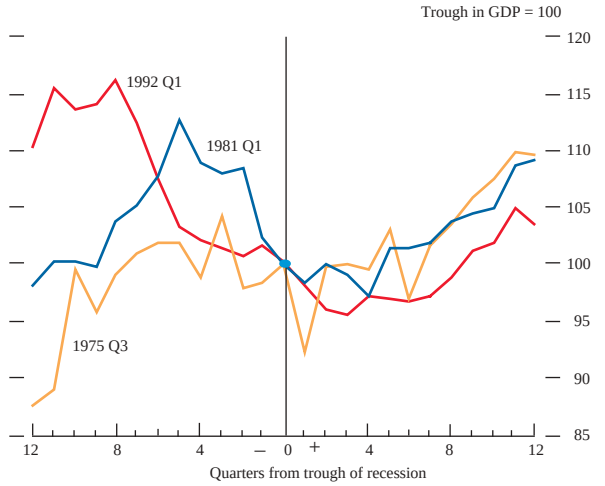
(a) At constant prices.
(b) Dates shown indicate the quarter in which the trough in output was reached.

recovery. Chart 3 shows the behaviour of business investment in the past three recoveries;[1] in each case, investment has been set equal to 100 at the trough in output. It shows that each downturn and recovery in investment has been different. But one feature of the present recovery to date is that business investment has recovered slowly and hesitantly.

Looking at non-residential investment overall, Charts 4, 5 and 6 show that although plant and machinery investment has been relatively slow to recover, investment in new buildings and works has been particularly subdued.

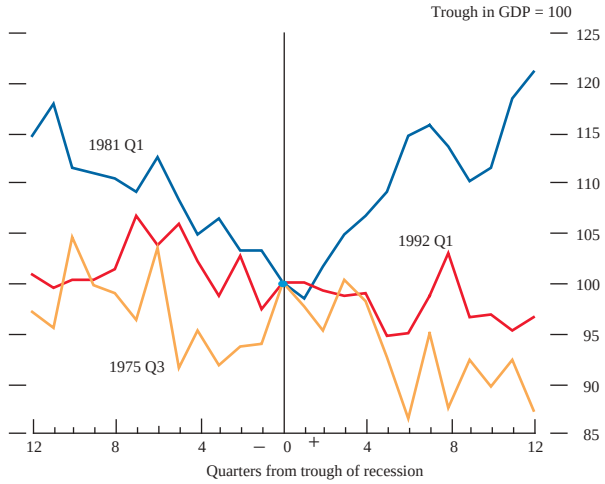
In sectoral terms too, there has been a wide diversity of behaviour. Investment growth last year was highest in 'other

Chart 4
Investment in plant and machinery in three recoveries[a][b]



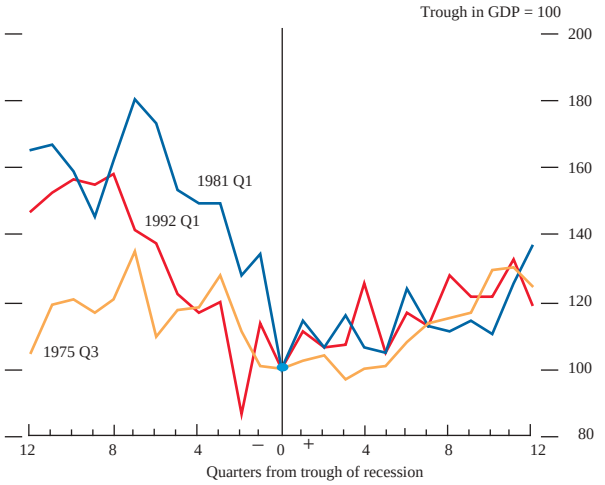
(a) At constant prices.
(b) Dates shown indicate the quarter in which the trough in output was reached.

Chart 5
Investment in new buildings and works[a] in three recoveries[b][c]



(a) Including transfer costs of land and existing buildings.
(b) At constant prices.
(c) Dates shown indicate the quarter in which the trough in output was reached.

Chart 6
Investment in vehicles, ships and aircraft in three recoveries[a][b]



(a) At constant prices.
(b) Dates shown indicate the quarter in which the trough in output was reached.

industries' (mostly services),[2] where it rose by about 8%; however, a key growth area in this sector was financial services. Manufacturing investment also grew by around 7% last year. The largest fall, of around 23%, was seen in the mining and quarrying industry. Utilities' investment also fell sharply—by around 13%.

About 90% of investment in mining and quarrying is accounted for by oil extraction. Offshore investment experienced something of a boom in the early 1990s, caused by the coincident development of several large fields. These have now come on stream; consequently investment has fallen.

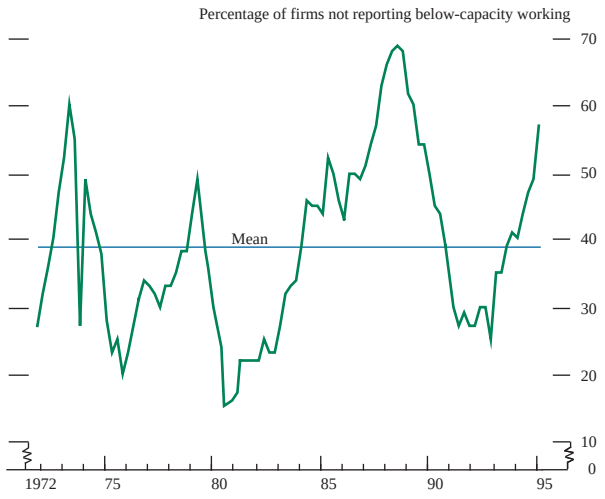
(1) Business investment is defined as total investment less investment in private sector dwellings, private sector and public corporations purchases of land and existing buildings, general government investment and investment by NHS Trusts. Broadly, it is investment by ICCs, financial companies and public corporations. Although the measure is wider than ICCs' investment, its advantages are that it is not affected by privatisations and is calculated by the Central Statistical Office at constant prices.
(2) The term 'other industries', as used by the Central Statistical Office, refers essentially to non-residential investment outside the extraction, manufacturing and utility industries.

Investment in the utilities sector has followed a broadly similar pattern: it grew strongly in the early 1990s and has since declined. The strong earlier growth seems, to some extent, to have reflected the bunching of several one-off projects. For example, investment in the electricity industries(1) in the early 1990s was boosted by the construction of gas-fired power stations, the fitting of equipment to reduce emissions from coal-powered stations, and the construction of the Sizewell B nuclear power station. It is also possible that there was a privatisation effect; the water and electricity industries were privatised between December 1989 to June 1991. The removal of public sector limits on borrowing might have allowed a backlog of projects to be cleared.

Specific sectoral developments aside, there are a number of possible factors that may have been constraining companies' investment growth in this recovery so far. One is the level of capacity. The investment boom in the late 1980s added greatly to capacity. The recession in the early 1990s was deep and long-lasting, and as a result created large amounts of spare capacity. The service sector suffered particularly in the last recession: services output contracted in 1991 and 1992—the only recorded fall in services output in two consecutive years since 1949. In asset terms, there was a significant boom in building work at the end of the 1980s, which has clearly been a factor in the weak expenditure on these assets in the past three years.

Although the experience has not been uniform across the economy, capacity utilisation has recovered. Rapid growth in financial services' investment suggests that spare capacity has not been a major factor in this industry. Moreover, capacity utilisation in manufacturing, on one measure,(2) exceeded its long-term average in 1993 Q4 and has continued to rise (see Chart 7).

Chart 7
Capacity utilisation in manufacturing

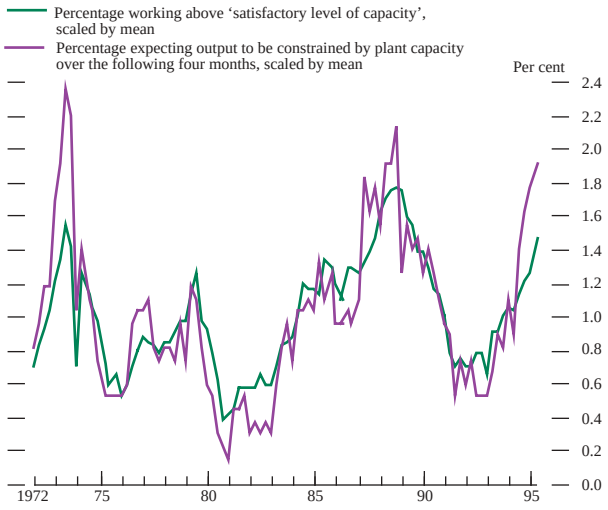


Source: CBI.

A second factor constraining investment growth has been uncertainty. An article in last August's *Bulletin* suggested that companies may have set high target nominal and real rates of return for investment projects in the 1980s to reflect the risks associated with high and volatile inflation.(3) Firms have been slow to adjust these rates of return downwards in the 1990s, because they have remained unconvinced that the new stable and low inflationary environment will persist.

The recent impact of uncertainty on investment may also be inferred from two CBI Industrial Trends Survey responses.(4) Chart 8 shows two series from the survey scaled by their respective means. One line is the measure of capacity utilisation, as in Chart 7; the other shows the proportion of firms that identify plant capacity as likely to constrain output over the following four months. Although other interpretations are possible, the diverging paths of the two series in the recent past could indicate that a greater proportion of respondents have viewed a potential capacity constraint on output over the following four months as 'satisfactory'. In turn, this may reflect firms' uncertainty about the durability of the current economic recovery. In other words, firms have perhaps been willing to risk losing future output and perhaps sales, because they have believed that the sunk costs of investing represented too big a gamble. This explanation is lent some weight by the export-led nature of the recent recovery. Exports tend to be more volatile than domestic demand and this may have added to producers' uncertainty.

Chart 8
Capacity utilisation and uncertainty



Source: CBI.

The structure of companies' balance sheets at the time of the recovery initially held investment back. The investment and take-over boom at the end of the 1980s led to companies borrowing heavily, mainly from banks. This left many with high levels of debt. The recovery has seen companies using

(1) This accounted for some 60% of utility investment in 1993.
(2) The percentage of respondents replying 'no' to the question in the CBI Industrial Trends Survey: 'Is your present level of output below capacity (ie are you working below a satisfactory full rate of operation)?'
(3) See 'Investment appraisal and low inflation', *Quarterly Bulletin*, August 1994.
(4) This point is made in Driver, C, 'Tightening the reins: the capacity stance of UK firms 1976–1995', forthcoming in *Rebuilding industrial capacity*, Grieve-Smith, J and Michie, J (eds), Oxford University Press.

Company insolvencies and inflation

This box investigates some of the determinants of insolvencies, and in particular the potential impact of inflation. Previous work has suggested a link between inflation and insolvencies; this box re-examines that proposition, given the experience of the recent cycle. It first outlines the different types of insolvency, and then examines recent trends. Finally, it examines whether inflation leads to a higher rate of company failures and discusses the implications of this. Econometric work in this area is not robust, but is suggestive of some of the determinants of insolvencies.

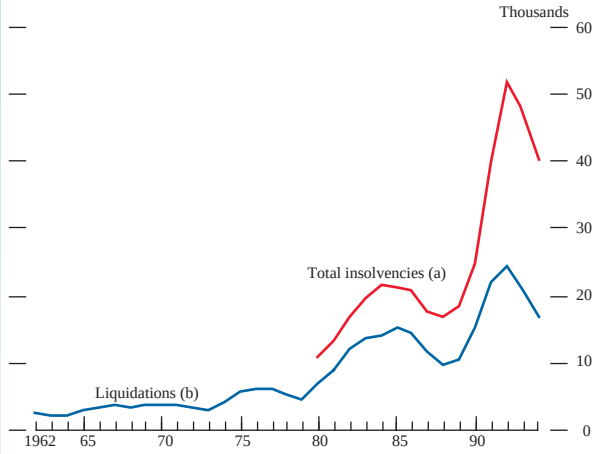
A company with obligations (eg guarantees) that it expects not to be able to meet is said to be *insolvent*.(1) Such a firm can either be liquidated, or placed into administration or receivership. A *compulsory liquidation* occurs when a company is made insolvent after a successful petition to the Courts by creditors; *creditors' voluntary liquidations* occur when an insolvent firm voluntarily goes into liquidation. The 1986 Insolvency Act instituted procedures to enable firms to continue trading under an *administrator* appointed by the Court. The administrator may reorganise the company or, if it is clearly insolvent, may petition the Court to wind up the company. Lastly, a *receivership* occurs when a creditor with debentures appoints accountants either to rescue the company or to sell off its assets.

Chart A shows two different measures of insolvencies: the Department of Trade and Industry's (DTI's) record of insolvencies and the Dun and Bradstreet measure of total insolvencies (available only since 1980). The latter measure includes receiverships, which have risen much more sharply than liquidations in the 1990s.

Experience of insolvency need not imply that a company will 'die'—part or all of it may be purchased or reorganised and return to trading. A recent survey by the Society of Practitioners of Insolvency suggested that roughly 18% of firms are preserved (in whole or in part) through the insolvency process.(2) It also suggested that it is larger firms that are more likely to be preserved; 28% of companies with a turnover greater than £1 million were saved by insolvency practitioners. In addition, insolvency figures do not include those companies that suffer financial distress but are rescued in a financial work-out, avoiding formal insolvency procedures.

Chart A suggests that insolvencies have been falling since 1992, although Dun and Bradstreet suggest that numbers rose in the second quarter of this year (by 10% compared with the previous quarter). According to the DTI estimates, there were around 16,730 liquidations in England and Wales in 1994, compared with around 14,900 in 1985. There were 160 administrations in 1994 (see Table 1 below); these remain a small proportion of total insolvencies. Dun and Bradstreet estimate that total insolvencies amounted to 40,160 in 1994, almost double their level in 1985. As Table 2 shows, in the recent recession insolvencies in services and the construction and transport sectors increased at a higher rate than elsewhere, but they have also fallen fairly significantly in these sectors in the recovery.

Chart A
Company insolvencies



(a) Source: Dun and Bradstreet. (Series began in 1980.)
(b) Source: DTI.

Table 1
Company insolvencies in England and Wales(a)

	1992	1993	1994	1995 Q1
Compulsory liquidations	9,734	8,244	6,597	1,380
Creditors' voluntary liquidations	14,691	12,464	10,131	2,154
Total liquidations	24,425	20,708	16,728	3,534
Administrator appointments	179	112	159	59
Company voluntary agreements	76	134	264	95
'Other' insolvencies	27,277	27,112	23,004	5,314
Total insolvencies	**51,957**	**48,066**	**40,155**	**9,002**

(a) Figure on liquidations, administrations and company voluntary agreements are from DTI. Total insolvency figures are from Dun and Bradstreet.

The Wadhwani model

In a study of the determinants of insolvencies, Wadhwani highlighted the role of inflation and its link to firms' cash-flow difficulties.(3) He argued that interest rates are a key determinant of insolvencies when debt is nominal and not indexed, giving rise to the problem of *front-end loading*. For example, if the real interest rate were a constant 1%, with zero inflation the nominal interest payment on a debt of £1,000 would be £10. If inflation were to rise to 10% while the real interest rate remained unchanged, however, nominal interest rates would rise to 11.1% and the interest payment to £111. In this case, revenue would rise tenfold, but interest payments would rise elevenfold.

(1) Insolvent individuals and small firms who are unincorporated are closed via the bankruptcy laws. They are not examined further.
(2) See 'Company insolvency in the UK, the third SPI survey', Society of Practioners of Insolvencies, 1994.
(3) See, for example, Wadhwani, S (1986), 'Inflation, bankruptcy, default premia and the stock market', *Economic Journal*, pages 102–38.

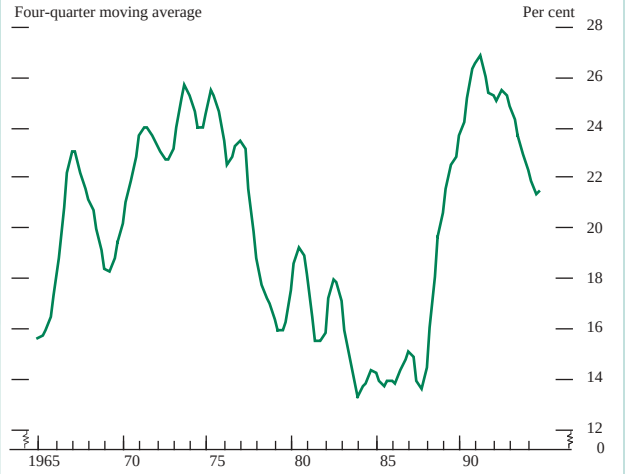
Table 2
Company insolvencies by sector

Percentage changes in italics

	1991	1992	1993	1994
Manufacturing	5,023	5,449	4,590	3,608
	31.0	*8.5*	*-15.8*	*-21.4*
Construction and transport	4,619	5,091	4,271	3,175
	36.8	*10.2*	*-16.1*	*-25.7*
Wholesaling	1,280	1,246	1,012	994
	20.1	*-2.7*	*-18.8*	*-1.8*
Retailing	2,114	2,477	2,005	1,711
	32.2	*17.2*	*-19.1*	*-14.7*
Services	3,538	4,361	3,748	2,843
	50.6	*23.3*	*-14.1*	*-24.1*
Others	5,254	5,801	5,082	4,397
	86.0	*10.4*	*-12.4*	*-13.5*
Total	**21,827**	**24,425**	**20,708**	**16,728**
	45.0	*11.9*	*-15.2*	*-19.2*

Source: DTI.

Chart B
ICCs' net debt to market valuation(a)



(a) ICCs' debt at market value as a proportion of their market value.

The effects of firms' institutional borrowing arrangements are also emphasised in Wadhwani's model. Agreements often specify a maximum debt to equity ratio or a ratio of profits to nominal interest payments. Such nominal rules will mean that if the firm's market valuation fails to keep pace with inflation, the probability of bankruptcy will rise.

Empirical results

Wadhwani's research covered the period up to 1981; he found that there were significant positive effects running from inflation, interest rates and the level of debt to rates of insolvency. Re-estimation of the Wadhwani model has shown a similar pattern of results for the period up to 1994. The *liquidation ratio*—the ratio of liquidations to the stock of 'active' companies—was strongly influenced by financial variables (debt, real interest rates and the inflation rate) over the sample period 1965 Q1–1994 Q2. In the re-estimation, a dummy variable was also introduced to allow for the introduction of the Insolvency Act of 1986. Debt was measured by the net debt of firms relative to their market valuation, as shown in Chart B. In the late 1980s, there was a sharp rise in this ratio (though only to levels similar to those in the early 1970s, when liquidations were lower). The net debt measure provides an alternative to looking at debt as a proportion of the capital stock; a rise in the ratio means that net debt is rising at a faster rate than the market value of those firms and—in the model—is assumed to increase the probability of bankruptcy.

The estimated long-run relationships are given by equation **(1)**:(4)

$$LR = 0.8\ D/MV + 0.72\ \Delta P + 1.3\ RR; \qquad \textbf{(1)}$$

where *LR* is the log of the liquidation ratio, *D/MV* is the ratio of net debt to market valuation, ΔP is annual producer price inflation and *RR* is the real interest rate (measured by the yield on short-term treasury bonds less the rate of producer price inflation). The estimated elasticities of the liquidation ratio (rather than the *log* of the ratio) with respect to each variable are:

for *D/MV*	0.2;
for ΔP	2.4; and
for *RR*	4.3.

Debt has a significant impact—a 1% increase in the ratio of net debt to market valuation may increase the liquidation ratio by 0.2%.(5) There are long-run effects on insolvencies from producer price inflation and real interest rates.(6)

These results are broadly comparable with Wadhwani's, although the other variables which were significant in his estimated long-run relationship—real wages and a time trend—were not significant in the re-estimations. Cyclical variables were not statistically significant, though there may be correlations within the data between cyclical activity and inflation. The 1986 Insolvency Act was found to have reduced business failures slightly, (although there is, technically, no long-run effect).(7)

This simple econometric model of insolvency is suggestive of the factors which may have contributed to the sharp rise in insolvencies in the recent recession: higher debt levels, real interest rates and higher inflation all seem to have increased insolvencies. And compared with 1985, debt in particular has been higher in this recovery. The reduction in corporate gearing, lower real interest rates and lower inflation may all have contributed to the sharp falls in business failures recently. And permanently low inflation may lead to a lower level of insolvencies in the long run.

(4) The single, four-variable cointegrating vector was identified using the Johansen method.
(5) Liquidation data are from the DTI.
(6) The specification is of the form, $\alpha 1\ (NR–\Delta P) + \alpha 2\ \Delta P$, which is equivalent to $\alpha 2\ NR + (\alpha 1 – \alpha 2)\ RR$, where *NR* is the nominal interest rate, *RR* is the real interest rate and ΔP is the inflation rate.
(7) There was also a sharp rise in the liquidation ratio in 1981 Q1: a dummy was included in the estimation to allow for this. It was found to be significant in the short run, but not in the long run.

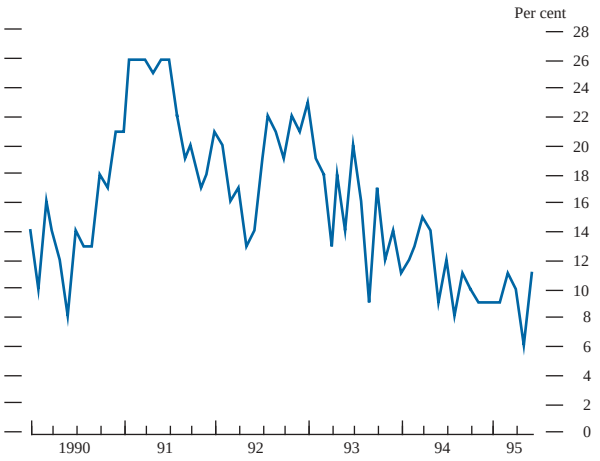
their rising incomes to reduce their liabilities to the banking sector. However, companies' net repayment of bank debt came to an end last year, suggesting that balance sheets have been repaired (see below).

Most commentators forecast that company investment will strengthen this year. With some of the factors that had constrained investment diminishing in importance and with profitability still high, the conditions are favourable for an increase in investment growth. Survey evidence also suggests a further pick-up. Recent CBI Industrial Trends Surveys, which include questions about investment intentions in manufacturing, have pointed in this direction. And British Chambers of Commerce Surveys have continued to show a positive balance of firms revising their investment plans upwards.

Stockbuilding

There was a strong upturn in stocks last year and stockbuilding was also high in the first quarter of this year. Stockbuilding can represent a voluntary decision by firms, in anticipation of future demand for their own product or of a shortage of their suppliers' products. Alternatively, it can be involuntary, if demand is less than anticipated. There are a number of possible interpretations of the recent past. The rise in manufacturers' stocks of materials and fuel in 1994 and 1995 Q1 may have reflected firms' willingness to build up stocks in anticipation of future supply problems, in the form of higher prices or shortages. Since 1993, there has been a downward trend in the balance of firms reporting in the CBI Industrial Trends Survey that their stocks of finished goods are more than adequate (see Chart 9). This might suggest that some manufacturing firms reached the stage where their stocks of finished goods needed replenishing. However, it is also possible that the slowdown in retail sales growth in 1994 and 1995 Q1 took retailers and manufacturers by surprise, leaving them with unwanted stocks of finished goods.

Chart 9
Adequacy of stocks(a)



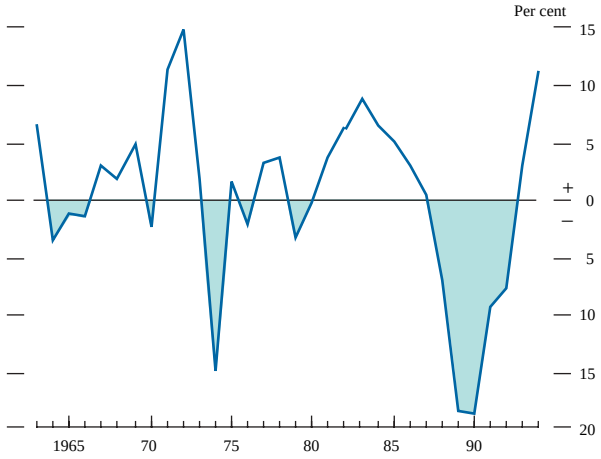
Source: CBI.

(a) Balance of firms reporting that current stocks of finished goods are more than adequate.

Financial transactions

One measure of ICCs' financial health that receives much attention is the financial surplus/deficit. Chart 10 shows that, on this measure, ICCs are in a fairly strong financial position, having been in financial surplus since 1993. The Central Statistical Office's preferred measure of the financial surplus/deficit is taken from the income and expenditure side of the accounts. But this clearly has counterparts in terms of financial transactions: changes in the level of companies' financial assets or liabilities should match the surplus (or deficit) of income over expenditure. However, the surplus measured from the income and expenditure side of the accounts does not match its counterpart measured from the financial transactions side. A balancing item is therefore included in the accounts to reflect this measurement error. Because this balancing item has been large in the past two years, there has been a financial surplus, measured from the financing side of the accounts, only since 1994—when it was substantially lower than the surplus on the income/expenditure measure.

Chart 10
ICCs' financial surplus/deficit as a proportion of income



Source: CSO.

One of the largest elements in ICCs' financial transactions over the past two years has been the issue of new equity (part of 'other borrowing' in Table B). Equity issues increased substantially in 1993, following the strong recovery in share prices at the end of 1992, but then fell back somewhat in 1994. The relative weakness of equity prices last year reduced the attractiveness of new issues. But in addition, some firms with cash surpluses engaged in share 'buy-backs'.

ICCs have made net repayments of bank borrowing in each year since 1991. In 1993 and 1994, they also increased their bank deposits. The combination of the two has substantially reduced the cost to ICCs of increases in short-term interest rates.

But 1994 Q4 and 1995 Q1 were the first consecutive quarters in which ICCs had borrowed from the UK banking sector since 1991. The figures for the first quarter of this year were heavily influenced by Glaxo's bank borrowing to fund its

Table B
Financial transactions of industrial and commercial companies

£ billions; current prices (a)

	1993 Year	1994 Year	1994 Q1	1994 Q2	1994 Q3	1994 Q4	1995 Q1
1. Financial surplus/deficit	3.5	14.8	3.9	4.1	4.0	2.8	2.6
2. Net unremitted profits	-5.7	-10.1	-2.2	-2.4	-2.9	-2.6	-2.7
3. Net trade credit	1.2	2.7	2.6	0.5	0.2	-0.6	2.4
4. Investment in UK company securities	-2.4	-3.9	-0.9	-0.4	-1.0	-1.6	-8.0
5. Investment abroad	-5.2	0.1	0.5	0.4	-0.2	-0.6	-1.1
6. Balancing item	-5.4	-6.2	-4.2	-3.1	-1.1	2.3	-3.2
7. Bank borrowing	-11.3	-4.8	-3.2	-2.7	-0.7	1.8	6.8
8. Other borrowing	37.5	17.7	6.3	6.5	2.3	2.6	4.6
9. Liquid assets	-6.6	-6.2	-3.4	-1.9	0.2	-1.2	0.5
10. Other assets	-5.5	-4.1	0.7	-1.1	-0.8	-2.9	-2.0
11. Net borrowing requirement	14.1	2.6	0.4	0.8	1.1	0.3	10.0

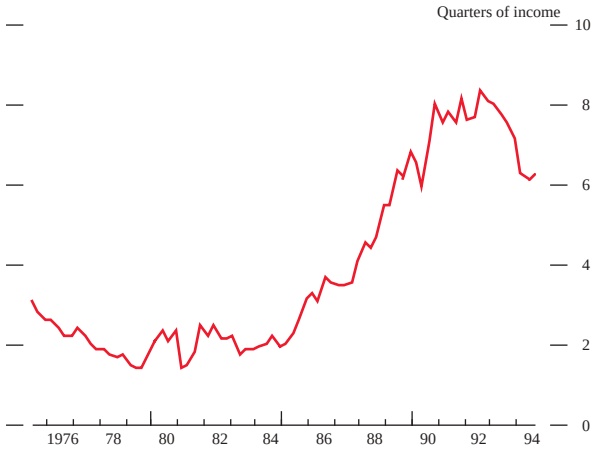
Source: CSO.

(a) Positive numbers represent inflows to, and negative numbers outflows from, the ICC sector.
(b) Lines 1–10 sum to zero; line 11 = 7 + 8 + 9 + 10.

take-over of Wellcome, but even after adjusting for this company borrowing was positive. Although ICCs as a group have not increased their investment, it is possible that some firms have begun to borrow to finance capital expenditure. But equally, with profits falling in the first quarter, it also possible that some companies needed finance for working capital.

While repaying bank borrowing, ICCs have continued to borrow from other sources largely at fixed rates. Indeed, ICCs' debt relative to their income has remained high compared with the levels seen in the late 1970s and early 1980s (see Chart 11). But companies may be content with this level of debt, particularly in light of their reduced exposure to short-term interest rate changes and relatively low income gearing.

Chart 11
ICCs' debt to income ratio(a)



Sources: CSO and Bank of England.

(a) Market value of ICCs' net debt as a proportion of their post-tax income. Data are available only to 1994 Q4.

As Table B shows, ICCs' purchases of UK company securities have been growing since 1992; they were boosted significantly in 1995 Q1 as a result of the Wellcome take-over. These data cover purchases of other companies' shares, rather than share buy-backs. They do not, however, capture all merger and acquisition activity (see the box on page 278); for instance, they exclude purchases of subsidiaries from other ICCs.

Another category of financial transaction which has recently been important for ICCs is investment abroad. This is measured in net terms: sales of UK ICCs' foreign assets are deducted from their investment. ICCs' net investment abroad rose by 20% in 1993, but fell sharply in 1994 when net investment was negative. The fall largely reflected an increase in repayments of loans by overseas subsidiaries to their UK parents. Investment abroad also includes cross-border acquisition activity. Net unremitted profits from abroad rose sharply last year: this represents the difference between the unremitted profits of foreign-owned firms in the United Kingdom and UK-owned firms overseas.

Mergers and acquisitions

According to official statistics, acquisition and merger activity within the United Kingdom—measured both by value and by numbers of acquisitions—has begun to recover from its trough in 1992. The value of these deals increased by 19% in 1993 and 17% last year, but this did not constitute a boom. (The box on page 278 looks at mergers and acquisition activity.) In the first quarter of 1995, the number of deals fell compared with the previous quarter, but the value of mergers was given a significant boost by Glaxo's purchase of Wellcome for a reported £9.1 billion.

Overseas acquisitions rose by over 60% in value terms last year; overseas disposals also rose significantly. However, the number of overseas acquisitions fell from 679 in 1992 to 422 last year. Reports from the Bank's agents suggest that, with output growth having come largely from the traded sector, companies have increasingly begun to see advantages in siting production closer to their foreign markets. This suggests that cross-border acquisitions may increase.

Table C shows the number of cross-border deals expressed as a share of the total in the European Union; it shows that, as in previous years, UK companies were the most active cross-border purchasers of other companies in 1994, with a share well in excess of the United Kingdom's share in general economic activity.

Table C
Breakdown by Member State of cross-border mergers and acquisitions and GDP

	1994 Target	Purchaser	GDP
Belgium	4.0	2.9	3.4
Denmark	5.3	4.7	2.2
Germany	29.5	18.4	27.7
Greece	0.3	0.1	1.4
Spain	9.0	0.9	7.3
France	15.2	18.3	20.0
Ireland	0.9	4.7	0.8
Italy	7.6	2.7	15.5
Luxembourg	1.0	1.6	0.2
Netherlands	7.2	11.5	5.0
Portugal	0.5	0.3	1.2
United Kingdom	19.4	34.0	15.4
EU 12	100.0	100.0	100.0

Source: European Commission.

Mergers and acquisitions

Microeconomic theory tries to explain mergers and acquisitions in a number of ways. Firms take over or merge with others for a variety of reasons, including: to increase their market power; to improve the use of resources via economies of scale or by reducing general managerial inefficiency; to satisfy managers' desires for larger 'empires'; to protect themselves from take-over, so making their managers' positions more secure; and to spread risk by creating conglomerates.

Empirical evidence suggests that the managerial objectives—of growth and protection of their own position—are the important reasons for merger or take-over.(1) Increased efficiency appears to have been a less significant result of acquisition or merger activity.

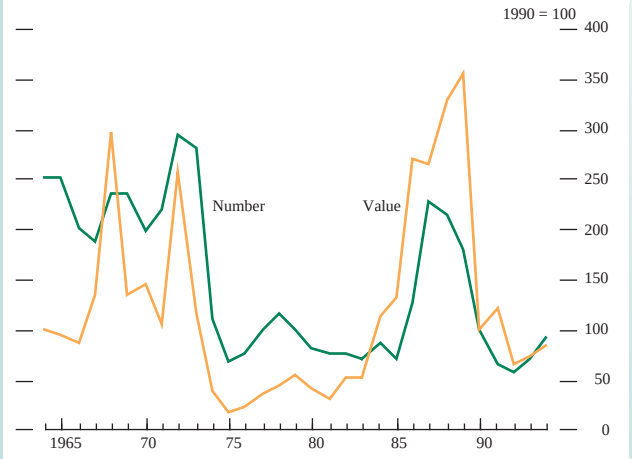
Recent work at the Bank has used company accounts to examine the financial characteristics of acquiring firms during the 1980s.(2) A range of financial characteristics were calculated—including profitability, rates of return, capital and income gearing, dividend payout ratios, interest coverage and liquidity. The work showed that acquiring firms did not have a distinct set of financial characteristics; the averages for acquiring firms were very similar to those for the whole sample. This suggests that mergers are not undertaken for immediate financial reasons. The only distinguishing feature of acquiring firms to emerge was size: acquiring firms were on average much larger than the sample average.

Merger activity within the United Kingdom

Mergers tend to occur in waves (see Chart A). In value terms, the recent peak years for merger activity were 1968, 1972, and 1985–89.(3) Take-over waves seem to some extent to follow the cyclical pattern of GDP growth and trends in profitability. But, as Chart B shows, there is also a relationship with equity prices.(4)

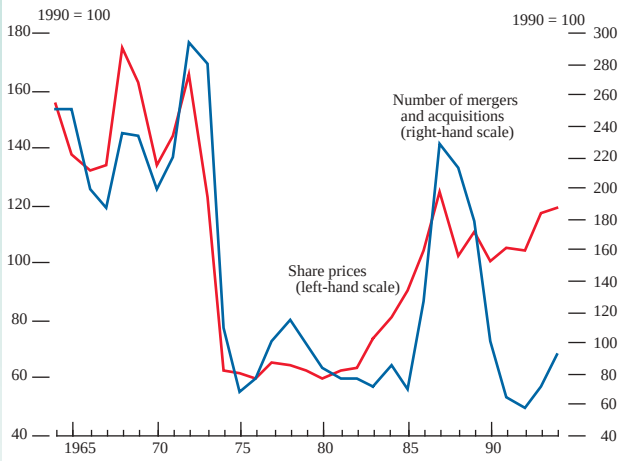
Movements in equity prices are, of course, connected to more general cyclical movements. And buoyant equity prices may themselves be a function of high levels of take-over activity. However, economic theory suggests that movements in share prices can affect take-over activity. Mispricing in the stock market will probably be greatest when share prices are changing rapidly. And predator firms are more likely to strike when equity prices are rising, as there will tend to be more favourable demand conditions in product markets for the enlarged firm to exploit. Equally when stock prices are high and rising, firms can more easily use equity to finance take-overs.

Chart A
Acquisitions and mergers by value and number



Sources: CSO, Companies House.

Chart B
Take-overs and share prices



Sources: CSO, Companies House.

The relationship with share prices was more complicated during the last merger boom. The number of mergers peaked in 1987, at the time of the stock market crash. But activity remained high and did not fall significantly until 1990. And in value terms, merger activity really took off *after* 1987 (see Chart A). One explanation is that take-over activity in the late 1980s may have been a function of special factors:(5) specifically, the Single European Act and financial deregulation. The Act introduced the prospect of a single European market and so of economies of scale, and, by enhancing future competition, reduced the need for the authorities to worry about the anti-competitive effects of merger activity. Following financial deregulation, banks and other lenders competed more aggressively for business; consequently, it became easier for firms to borrow to finance take-overs.

Cross-border activity

Like acquisitions within the United Kingdom, the value of cross-border activity peaked in 1989.(6) In that year, acquisitions in the United States by UK firms accounted for nearly 80% of their cross-border acquisitions; last year they formed only about half. It is not surprising that the United States should be so prominent, given the size of its market and the common language. But acquisitions by UK companies in other EU countries have grown in importance recently, as might be expected with increasing European integration.

(1) See Hay, D A and Morris, D J, *Industrial economics and organisation*, Oxford University Press 1991, which provides a useful summary of merger theory and evidence.
(2) The work used data supplied by Datastream International; on average, the sample consisted of 900 quoted firms a year.
(3) Activity within the United Kingdom covers industrial and commercial companies only. The value and number of mergers and acquisitions have been divided by current-price GDP and the number of registered companies respectively to allow for the effect that increasing activity and prices have on the series.
(4) Equity prices are given by the FT All-Share index divided by current-price GDP to allow for the effect of activity and general price rises on the index.
(5) See, for example, Begg, D, Fischer, S and Dornbusch, R, *Economics*, McGraw-Hill, 1994.
(6) Data are only available from 1987. Cross-border activity data cover industrial and commercial companies and financial companies.

Insolvencies

According to Department of Trade and Industry estimates, the number of company insolvencies in England and Wales continued to decline both last year and in the first quarter of this. The falls appeared to be evenly spread across sectors, although they were less pronounced in wholesaling. The box on pages 274–75 gives some more general background on insolvencies and considers some econometric models of insolvency behaviour.

Summary

Aggregate figures often hide a wide diversity of behaviour. But corporate sector data suggest that companies ended 1994 in a healthy financial state: profitability was at a relatively high level; companies ran a financial surplus; and insolvencies declined for the second successive year.

Industrial and commercial companies' investment failed to recover last year, however. This was in part the result of special sectoral factors. But cautious expenditure on fixed assets in the recovery so far may also reflect the high levels of spare capacity built up in the recession, firms' uncertainty about the sustainability of the recovery and of low inflation, and their need to restructure balance sheets. With capacity pressures growing, profitability high and signs that balance-sheet adjustment may have been completed, however, investment is likely to strengthen during this year.

Stockbuilding made a positive contribution to domestic demand last year—probably for a number of different reasons. Firms at the start of the supply chain may have been building up precautionary inventories, whereas companies closer to the consumer may have accumulated unwanted stocks because retail sales growth was lower than anticipated.

The Bank's new UK commodity price index

By Andrew Logan and Lucy O'Carroll.[1]

As a consequence of their method of calculation, existing commodity price indices do not provide an accurate summary measure of commodity price pressures in the UK economy. The Bank has therefore constructed a new commodity price index, which it uses in its analysis of inflationary pressures in the Inflation Report. *This article outlines how it is constructed, compares its recent trends with those of other major indices, and assesses how informative the Bank index is about price movements further along the supply chain.*

Introduction

Indices which weight together movements in the prices of 'basic' commodities are often used in analysing inflationary pressures. One reason for this is that, since basic commodities are usually purchased for further processing, changes in their prices will affect producers' costs, and these changes may eventually be passed on to consumers. Some commodities are also purchased by consumers in their unprocessed state (fresh foodstuffs, for example); price changes in these goods affect retail prices directly. In addition, to the extent that commodity prices are determined in auction markets that respond immediately to factors affecting demand and supply, they may be more flexible and adjust more quickly to news than, for example, the general price level or wages. If so, commodity price indices may also give early warning of turning-points in the economic cycle.

In the past, analysts have had a variety of such indices from which to choose, differing in the nature and geographical coverage of the price pressures being measured. In general, however, these indices have not reflected UK commodity price pressures—for three main reasons.

First, the weights they give to the various commodities do not reflect their relative importance for the UK economy, since they are normally not based on domestic demand (indigenous production minus net exports). Second, some of them use prices obtained by translating *world* market prices into sterling equivalents. This method is inappropriate for the prices of agricultural commodities grown within the European Union, since these are generally covered by the Common Agricultural Policy (CAP).[2] Finally, the indices generally do not cover fuels comprehensively.

The Bank has constructed a new index to address these three issues. The index is based on UK demand for basic commodities—both directly by consumers and indirectly through the production process. Its construction does, however, raise a number of technical issues; it is easier to point to problems with indices than to correct them. In particular, since the Bank's index excludes, as far as possible, semi-manufactured and processed goods, it may underestimate the importance to the UK economy of unprocessed commodities—such as timber or natural rubber—which are used in production but are not imported in large amounts in their raw state. Furthermore, because of the importance of labour costs and other components of value added, the new index's links to the general level of prices in the economy may be quite weak.

What the new index does provide, however, is information on movements in the prices of basic, unprocessed goods which affect the general price level in the United Kingdom; and it does this more accurately than many alternative indices. Movements in the components of the index (metals, fuels, non-food agriculture, non-indigenous foodstuffs and indigenous agricultural commodities) may also be of interest where they can be used to identify possible sources of sectoral price pressures: strong movements in agricultural prices, for example, will have a particular impact on food manufacturing industries. This information can help in the understanding and interpretation of inflationary pressures in the economy and is used, for example, in the analysis of price dynamics in the Bank's *Inflation Report*.

Constructing the index

Weights and prices

The Bank's new index weights commodities by estimates of the value of demand in 1990. Ideally, this weighting should be done using consistent data on domestic production, imports and exports; net exports could then be subtracted from production to give figures for the use of the various

(1) The authors work, respectively, in the Bank's Conjunctural Assessment and Projections Division and Structural Economic Analysis Division. They would like to thank all those who attended the commodities workshop held at the Bank in March 1995 for their helpful insights; but any errors remain the authors' responsibility.

(2) The Hongkong and Shanghai Banking Corporation (HSBC) index does use European prices—which are influenced by the CAP—for wheat, maize, beef and pork.

commodities. Unfortunately, in practice it is not possible to follow this method throughout, and the Bank index uses the best available weighting option for each commodity group. Where possible, data for production, imports and exports of an individual commodity have been taken from the same source. Where a number of data sources are available for a commodity, their merits have been compared. Price series have been chosen on the basis of their representativeness and timeliness. And a number of specialist organisations have given advice on both weights and prices.

The main elements of this *ad hoc* process are:

- *Metals*: Data collected as part of the new European standard business inquiry (Prodcom) are used to provide consistent figures for UK use.(1) Weights have been rescaled from 1993 to 1990. Spot prices from the London Metals Exchange (LME) are used for the price series.

- *Fuels*: Domestic production and net export values are obtained directly from the 1991 Digest of UK Energy Statistics. Prices are based on the price for one month forward Brent crude (which is far more heavily traded than the spot contract) for oil, the Central Statistical Office's (CSO's) coal mining output price and the retail prices index (RPI) natural gas price, excluding VAT effects.(2)

- *Non-food agriculture*: Prodcom data provide consistent figures for UK demand for timber and cork, rescaled to 1990. The index assumes that there is no domestic production of cotton, natural rubber or tobacco, and uses net import values [based on three-digit Standard Industrial Trade Classification (SITC) codes, which provide the most comprehensive definition of each of the basic commodities].(3) Timber and cork prices are based on the CSO's producer input import price, the natural rubber price is taken from an average physical auction price for deliveries in the United Kingdom, the tobacco price is taken from International Financial Statistics (IFS), and the cotton price is based on an average of price quotations, published in Cotton Outlook.

- *Non-indigenous foods*: It is assumed that there is no indigenous production of cocoa, coffee, tea, rice, bananas and edible oils.(4) Net import values are based on three-digit SITC codes for all non-indigenous foods except edible oils—where Prodcom estimates are used and rescaled to 1990—and bananas, where four-digit (more disaggregated) SITC codes are used. Cocoa prices are obtained from the London Commodities Exchange, and coffee, rice, banana and tea prices from IFS; the prices of edible oils are based on producer input import prices.

- *Indigenous agriculture*: The weighting is based on the value of total UK agricultural production; this includes, among other items, cereals, milk, livestock and wool clip. The price series is taken from the monthly agricultural price index published by the Ministry of Agriculture, Fisheries and Food (MAFF).(5) This series is based on the prices received by farmers for their output, and so reflects the impact of the CAP.

Comparing the Bank index with other indices

The resulting weights—for both the oil-inclusive and non-oil versions of the index—are shown as percentage shares in Table A. Table B gives a comparison with the weights used in a number of other indices. It should be noted, however, that the different indices sometimes include different commodities within the broad categories in Table B, as a result of choices made in constructing them.

Table A
Weights for the Bank's commodity price index(a)

Percentages

	Including oil	Excluding oil
Metals	**5.6**	**7.1**
Aluminium	2.3	2.9
Copper	1.8	2.3
Lead	0.6	0.8
Nickel	0.2	0.2
Tin	0.1	0.2
Zinc	0.6	0.7
Fuels	**51.6**	**38.8**
Crude oil	21.0	—
Natural gas	18.5	23.5
Coal	12.1	15.3
Non-food agriculture	**5.5**	**6.9**
Timber and cork	4.6	5.8
Tobacco	0.6	0.8
Natural rubber	0.2	0.2
Cotton	0.1	0.2
Non-indigenous food	**2.2**	**2.8**
Bananas	0.5	0.7
Cocoa	0.4	0.5
Coffee	0.4	0.6
Rice	0.3	0.4
Tea	0.2	0.2
Edible oils	0.3	0.4
Indigenous agriculture	**35.0**	**44.4**
Total	**100.0**	**100.0**

(a) Based on 1990 values.

As Table B illustrates, the Bank's new index differs significantly from other indices. Metals make up less than a tenth of the Bank's index but a third of the Economist index, for example. The latter is weighted according to the value of imports into all OECD countries: it is not UK-specific. Like the Bank index, the HSBC index places a relatively small weight on metals (12.7%). In general, it is the closest of the other major indices to the Bank's; it is the only other one in Table B to have UK-specific weights, but these are estimated

(1) Prodcom (Products of the European Community) is a new business inquiry on the value and volume of production for all manufacturing activity; it is published in 'UK markets' by Taylor Nelson and the Central Statistical Office. It does not at present provide suitable data on all commodities for the compilation of the index.
(2) VAT is excluded because changes in it do not reflect movements in demand or supply fundamentals.
(3) The use of *net* imports where there is no domestic production may be explained, at least in part, by re-exporting of the commodities involved. There may be some semi or fully processed exports (and imports) included here, but efforts have been made to keep these to a minimum. The implications of this exclusion are discussed further.
(4) Rapeseed is produced in significant quantities in the United Kingdom, and so is included in indigenous agriculture. Bananas are the only important non-indigenous fresh produce for which it has been possible to obtain a reasonably representative price series.
(5) The agricultural price index does not take into account imports (or exports) of basic agricultural commodities which may be produced domestically. This is a significant omission in the case of fresh fruit and vegetables, where a large amount of UK demand is met by imports.

Table B
Weights in various commodity price indices

	Metals	Fuels	Non-food agriculture	Foodstuffs
Non-oil				
Bank	7.1	38.8	6.9	47.2
Economist	33.3	—	19.3	47.4
IMF	20.2	—	22.9	56.9
CRB (a)	21.7	—	30.4	43.5
Oil-inclusive				
Bank	5.6	51.6	5.5	37.2
HSBC (a) (b)	12.7	25.8	14.5	36.1
UN (a)	2.2	23.6	24.9	49.0

(a) These indices include commodities that do not fall within any of the four categories. The weights presented in this table therefore do not sum to a hundred.
(b) The HSBC index includes coal (with a weight of 12.4%) along with gasoline, gas oil and fuel oil (with a combined weight of 13.4%). It does not, however, include natural gas.

from the producer input price index, rather than by whole-economy demand. So it does not take account of price movements in those commodities—particularly some agricultural goods—which feed directly into consumption.

The Bank index gives a much greater weight to fuels: even in the non-oil version, fuels—coal and natural gas—make up almost 40% of the index. By contrast, as Table B shows, non-food agricultural products (timber and cork, tobacco, natural rubber and cotton) are given much less weight in the Bank index than in the weights of the other indices. The International Monetary Fund (IMF) and United Nations (UN) indices (both of which are weighted according to export values in developed countries) give this commodity group a weight of between a fifth and a quarter.(1) The Commodities Research Bureau (CRB) index, which is US-based, weights each of its 23 chosen commodities equally and places a similar overall weight (30.4%) on non-food agricultural commodities. The Bank index, on the other hand, accords them a weight of less than 7%.

Overall, the indices apply more similar weights to foodstuffs than to the other commodity groups. Within the total figure, however, the Bank's index accords a much higher weight to indigenously produced agricultural commodities relative to non-indigenous foodstuffs than some of the other indices. The Economist index, for example, gives a weight of around 30% to foodstuffs not generally produced in the United Kingdom, compared with under 20% to indigenous agriculture; the weights in the Bank index are 2.8% and 44.4% respectively.

Part of the differences between the Bank index and the other indices can, however, be explained by the fact that the Bank index includes certain non-food agricultural products in its 'indigenous agriculture' component (which are included, along with non-indigenous foods, in foodstuffs in Table B). Wool clip is one example, though its weight is very small (less than 0.5% of the indigenous agriculture commodity group). And whereas some of the other indices include animal hides in non-food agriculture, these are part of the value of the livestock in MAFF's agricultural price index.

Comparison of these indices suggests that there is little 'convention' in their construction: approaches vary according to the nature and geographical coverage of the price pressures that analysts wish to measure. So for those interested in movements in the prices of basic commodities in the United Kingdom, the Bank's new index provides a useful alternative to previous approaches.

Other price pressures

Since the Bank index, by its nature, excludes (so far as possible) semi-finished and finished goods, it may not pick up other sources of price pressure. For example, the HSBC index includes chemicals; it is the only one in Table B to do so. Chemicals are not conventional 'basic' (ie unprocessed) commodities and since many are oil-based, including them in the Bank index could lead to double-counting. But if a country imports large quantities of chemicals, rather than producing them domestically using oil as an input, then excluding them will underrepresent the importance of oil price movements to the economy.

Similarly, the United Kingdom imports many semi-finished or finished goods containing the unprocessed commodities (such as timber, natural rubber and cotton) listed in Table A. These semi-finished and finished goods are specifically excluded from the index because it is not possible to separate the commodity demand from labour costs and other components of value added which may vary over time. But this implies that the basic commodities used as inputs to them are excluded, and the importance of their price pressures is underestimated. The point is particularly relevant for countries like the United Kingdom, where semi-finished and finished goods form an increasing proportion of imports: the percentage of UK visible imports accounted for by basic commodities has fallen from around 45% in 1970 to under 20% in 1994.(2) In such cases, the information about domestic price pressures provided by any index of basic commodity prices will become progressively less useful.

Other factors may have played a part in this process. Technological developments have both lowered production costs and encouraged the more widespread use of synthetic substitutes for some commodity groups. The growth of the service sector may also have helped to reduce commodities' importance to the whole economy. And other factors, such as wage costs and the margins on semi-finished products, may become more important further along the supply chain.

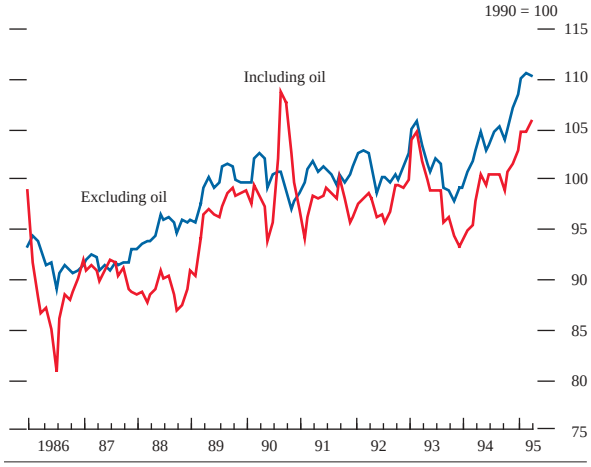
Recent trends in the Bank index

Movements in the overall index

Chart 1 presents the movements in the non-oil and oil-inclusive versions of the Bank index from 1986 to the present. It shows that the non-oil index has been much less

(1) This comparison is based on the UN's index for developed countries and the IMF's index for industrialised countries (rather than their headline indices), as they provide a more relevant comparison for the United Kingdom.
(2) Basic commodities are defined for this purpose as food, beverages and tobacco, basic materials and fuels, in accordance with the CSO's definitions in its *Monthly Review of External Trade Statistics*.

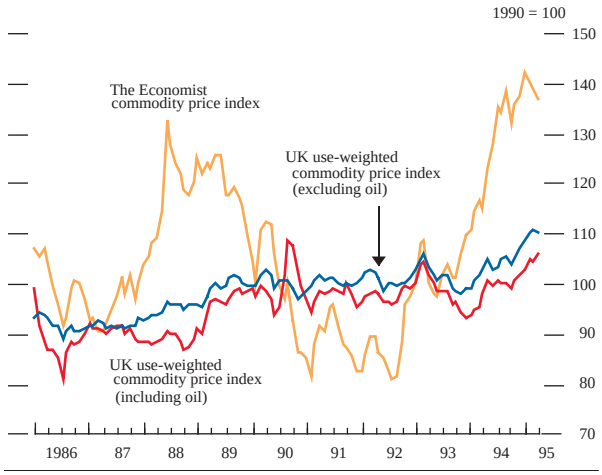
Chart 1
UK use-weighted commodity prices



volatile over the period, because it was less affected by the strong movements in oil prices in the late 1980s.(1) Since the end of 1990, however, the two versions have tended to track each other more closely.

Chart 2 contrasts the Bank's indices with the Economist sterling index, which excludes oil and is probably the most widely quoted of the major indices discussed in the previous section. The Bank non-oil index is much less volatile than the Economist index. In particular, although it did rise noticeably from mid-1986 to mid-1989, it did not mirror the strong increase in the Economist index during this period.

Chart 2
Bank and Economist commodity price indices



And whereas the Economist index fell significantly between 1990 and mid-1992, the Bank index did not display any particular trend. The Economist index also rose far more emphatically from mid-1992, as the world economy came out of recession. Both the oil-inclusive and non-oil versions of the Bank index rose quite strongly during 1994, but less than the Economist index. The latter has faltered in the early part of 1995, while the Bank index has remained strong.

Behaviour of the commodity groups

Tables C and D provide explanations of the relatively low volatility of the Bank index, showing the contributions of the different commodities to the annual (December to December) movements in the Bank and Economist indices. Table C details movements in the oil-inclusive Bank index, and Table D compares the non-oil version with the Economist index, including the movements from December 1994 to April 1995.

Table C shows that most of the changes in the Bank index arose from movements in the prices of metals, indigenous agricultural produce and fuels. Price changes in non-food agricultural commodities and foods not grown domestically had a minor impact—each contributing less than one percentage point to the Bank index in any year. This point is worth stressing given the publicity that price movements in some of these commodities attract: for example the increase in coffee prices following the news of frosts in Brazil in 1994.

Table C
Contributions to movements in the (oil-inclusive) Bank index, 1989–94

Per cent

	1989	1990	1991	1992	1993	1994
Aluminium	-0.6	-0.5	-0.5	0.7	-0.1	1.5
Copper	-0.4	-0.3	-0.2	0.4	-0.4	1.2
Lead	0.1	-0.2	-0.1	—	—	0.2
Nickel	-0.1	—	—	—	—	0.1
Tin	—	—	—	—	—	—
Zinc	—	-0.2	—	—	—	0.1
Metals	**-1.0**	**-1.2**	**-0.8**	**1.1**	**-0.5**	**3.1**
Coal	-0.2	—	0.5	—	-1.9	-0.7
Natural gas	0.5	1.6	0.9	-0.6	-0.1	—
Crude oil	7.8	2.6	-5.8	2.8	-4.6	1.9
Fuels	**8.1**	**4.2**	**-4.4**	**2.2**	**-6.6**	**1.2**
Cotton	0.1	—	—	—	—	—
Rubber	—	—	—	0.1	—	0.1
Timber	0.6	0.3	-0.1	—	0.6	0.8
Tobacco	0.1	-0.1	—	0.1	—	—
Non-food agriculture	**0.8**	**0.2**	**-0.1**	**0.2**	**0.6**	**0.9**
Cocoa	-0.1	—	0.1	—	0.2	—
Coffee	-0.2	—	-0.1	0.1	—	0.4
Edible oils	—	—	—	—	0.1	0.1
Rice	—	-0.1	—	—	0.1	-0.1
Tea	0.1	-0.1	—	0.1	—	—
Bananas	—	-0.1	—	—	0.1	0.2
Non-indigenous foods	**-0.2**	**-0.3**	**—**	**0.2**	**0.5**	**0.6**
Indigenous agriculture	**4.2**	**-1.6**	**1.5**	**0.4**	**—**	**2.9**
Index	**10.8**	**1.0**	**-4.0**	**3.8**	**-6.0**	**8.7**

Note: The contributions are calculated from an approximate decomposition of the price index; they therefore contain a residual error.

It is evident from Table C that metal prices have tended to be volatile and highly correlated with one another; in any one year different metals' contributions have typically been in the same direction. Metal prices declined in 1989 and the following two years, reflecting the substantial expansion in exports to western markets from the former Soviet Union and new information about the weakness of demand as activity levels fell in the industrialised economies. In each of these years, movements in metal prices lowered the

(1) There may be links between oil prices and the prices of gas and coal, so that the non-oil index would itself be affected by oil price movements.

Bank's oil-inclusive index by around one percentage point. After 1991, there was no clear trend in metal prices until October 1993, when they began to pick up. Their sharp growth in 1994 accounted for 19.6 percentage points of the 25.3% rise in the Economist index, and 3.9 percentage points of the 7.9% rise in the Bank's non-oil index.

In contrast to metal prices, the prices of non-indigenous foods have not tended to move in the same direction. This may reflect lower sensitivity to the level of industrial activity and a greater role for supply shocks—particularly from weather conditions—to individual commodities. Oversupply in both cocoa and coffee markets kept their prices relatively subdued until 1992. The impact on the Bank's index was small, however, with price changes generally making an impact of no more than 0.2 percentage points. Even the Brazilian coffee price rise in 1994 added only around half a percentage point to the Bank's index. The larger impact that these price movements had on the Economist index reflected the fact that its combined weight for cocoa and coffee is around 15%, compared with 1% in the Bank index.

Table C shows that, in terms of their impact on the Bank index, movements in crude oil prices have dominated all the other commodity groups in every year except 1994. Crude oil prices rose in 1989 and 1990; the Iraqi invasion of Kuwait in August 1990 provoked a rapid increase in the price of crude oil—with Brent crude rising from around $18 a barrel in July to nearly $35 a barrel in October, before falling back to just over $18 a barrel in February of the following year. This explains the spike in the Bank's oil-inclusive index (see Chart 1). In the non-oil index, fuel price rises contributed to the overall rise in the index in 1991, outweighing the fall in metal prices. In 1993, a sharp fall in the price of coal, as electricity companies negotiated new, lower-price contracts with British Coal, dominated other price changes.

Table D shows that between 1989 and 1991 indigenous agriculture was the prime contributor to movements in the Bank's non-oil index, and that in 1994 it was the second most important factor. Generally, the prices of domestically produced agricultural commodities are, like those of non-indigenous foods, less sensitive to the level of overall demand in the economy than metal prices. This is not only because they are subject to other shocks, such as the weather, but also because they are affected by changes to the Common Agricultural Policy. In addition, they are influenced by the effect of exchange rate changes on CAP prices; the devaluation of the 'green pound' by more than 20% since 1992 has raised CAP prices in the United Kingdom by more than 27%.(1)

Table D
Comparing contributions in the (non-oil) Bank and Economist indices

Per cent

	1989	1990	1991	1992	1993	1994	1995
Bank:							
Metals	-1.3	-1.5	-1.0	1.4	-0.7	3.9	-0.5
Fuels	0.5	2.0	1.8	-1.1	-2.7	-1.1	0.4
Non-food agriculture	1.0	0.2	-0.1	0.2	0.7	1.1	—
Non-indigenous food	-0.2	-0.3	—	0.3	0.6	0.8	-0.2
Indigenous agriculture	5.3	-2.1	1.9	0.5	—	3.7	3.6
Index	4.3	-1.9	2.7	0.8	-2.0	7.9	3.1
Economist:							
Metals	-6.7	-7.2	-4.2	5.7	-4.1	19.6	-1.6
Non-food agriculture	2.8	-4.5	-0.5	5.1	6.6	2.2	1.4
Foodstuffs	-2.9	-9.5	0.9	7.0	9.5	8.0	-0.6
Index	-8.5	-21.3	-4.7	18.2	12.6	25.3	-0.5

Note: The contributions are calculated from an approximate decomposition of the price index; they therefore contain a residual error.

The Bank index did not fall at the beginning of the UK recession in 1989, for example, because the drop in metal prices was outweighed by a very strong increase in agricultural prices. Prices fell somewhat in 1990, however, before recovering again. More recently, the devaluations in the green pound during 1994 and early 1995, reflecting the decline in sterling's value, have contributed to the upward movement in the index shown in Chart 1. Table D shows that the non-oil Bank index increased by 3.1% between December 1994 and April 1995, while the Economist index fell by 0.5%; the Economist index does not pick up the increases in sterling-denominated CAP prices resulting from the green pound devaluations (although it does reflect rises in the prices of imported foodstuffs as a result of sterling's devaluation). These increases may have an impact on the costs of food manufacturing industries, and also on the prices of imported fresh produce purchased directly by consumers.

In the fuels sector, the impact of further deregulation in the gas industry—where commercial and domestic markets are due to be fully open to competition by April 1998—may have significant effects on the aggregate level of commodity prices. Again, these effects will not be picked up by many of the other major indices.

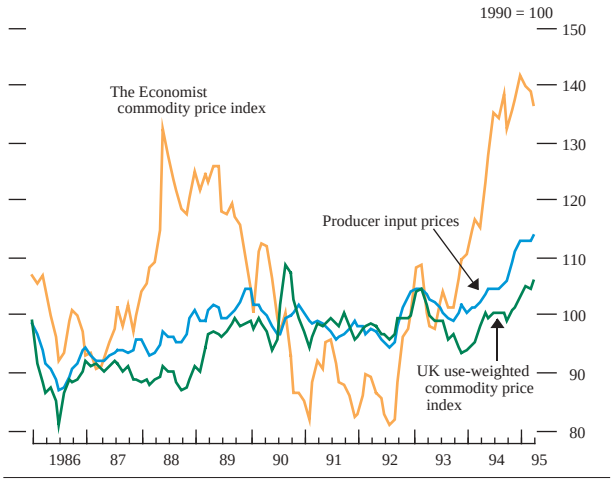
Comparisons with producer and retail prices

Charts 3, 4 and 5 compare the behaviour of the Bank and Economist indices with price movements further along the supply chain—in Chart 3 with producer input prices, in Chart 4 with producer output prices and in Chart 5 with retail prices.

It is clear from Chart 3 that the Bank index is much more closely correlated with producer input prices than the Economist index. The correlation of the two commodity price indices with the other price indices appears to decline further along the supply chain, although the Bank's index continues to be the more closely correlated because of its lower volatility. This decline occurs because the value added at each stage of additional processing, together with the costs of distribution and sale to the final consumers, increasingly outweigh the prices of the original raw materials. For example, over 40% of the purchases of raw materials and fuels by *manufacturers* that appear in the producer input price index are of commodities in the Bank's

(1) For a fuller explanation and discussion of the impact of green rates of exchange, see the box on page 46 of the May 1995 *Inflation Report*.

Chart 3
Commodity prices and producer input prices



index (with the rest of the producer input price index being made up of purchases of, for example, electricity and synthetics). In the *retail* prices index this figure is reduced by around half, with foods accounting for approximately 14% and fuels (for domestic heating and motoring) a further 6% or so.

The charts provide little evidence that the Bank's index is a leading indicator; its relationship with input prices, for example, appears to be roughly coincident. This is not surprising: the prices of some of the most important commodities in the Bank index—indigenous foods and natural gas—are determined in large part by policy changes,

Chart 4
Commodity prices and producer output prices

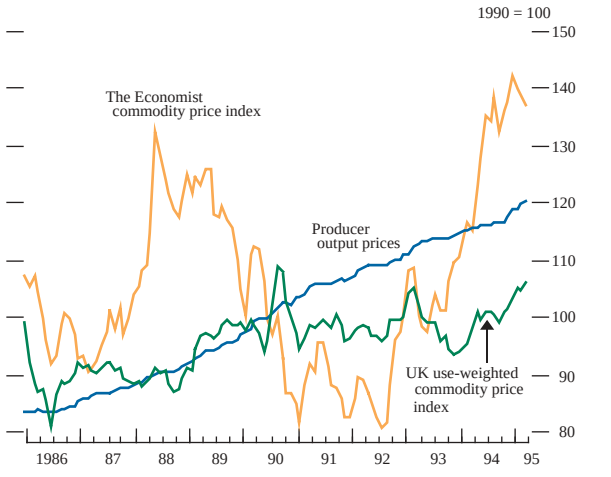
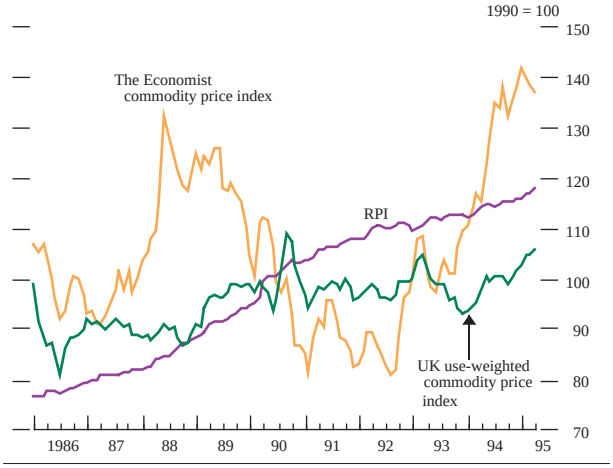


Chart 5
Commodity prices and the RPI



rather than being set in auction markets where new information on demand and supply conditions can be taken into account instantly in price formation, enabling commodity prices to adjust rapidly.

Conclusion

Care is needed in interpreting movements in commodity price indices, since their coverage differs widely. In particular, some of the major indices are not designed to reflect UK commodity use, and accordingly neither cover fuels comprehensively nor use appropriate agricultural prices.

The new Bank index has been constructed to address these issues. As a result, it has strong links to UK producer input prices. Even this new index, however, is not particularly informative about price movements which take place further along the supply chain and at the retail level, because the importance of commodity prices diminishes as other costs (such as wages and margins) become more important. Technical and other developments may also be reducing the influence of commodity prices over time.

Nevertheless, the price behaviour of unprocessed commodities does provide an extra piece of information, which may be of value in understanding and interpreting inflationary pressures in the United Kingdom. To be of greatest use, an index must be representative of the actual movements of commodity prices in the United Kingdom and of their relative importance. The Bank's new commodity index is constructed for this purpose.

The behaviour of the foreign exchange market

By Professor Alan Kirman.[1]

In this article, Alan Kirman considers what developments in economic theory have to contribute to an understanding of the recent evolution of the foreign exchange market. After outlining the standard, efficient-markets *model of the workings of the market, he looks at various reasons why that model has been questioned and examines the extent to which alternative models can offer a better explanation of the market's actual behaviour.*

Professor Kirman was a Houblon-Norman fellow at the Bank in August of last year.[2] The views expressed in this article are his, rather than those of the Bank.

The global foreign exchange (FX) market had a daily turnover of about $1.3 trillion in 1992, corresponding to a net daily turnover of $880 billion; this represents growth of 40% in three years.[3] 60% of this turnover is accounted for by the three main centres—the United Kingdom, the United States and Japan—of which the United Kingdom is the largest, with 60% more turnover than the next market, the United States. The market is becoming increasingly active; on the Reuters electronic dealing system, as many as 40,000 electronic 'conversations' occur per hour and there are 4,000 banks worldwide linked to this system with some 18,000 terminals. The market is also more and more global, with 60% of the daily transactions in 1992 being cross-border and with 80% of the aggregate FX turnover in London, for example, being done by foreign banks.[4]

Globally, 50% of gross foreign exchange transactions involved non-local currencies on both sides of transactions. The growth of the FX market has been much more rapid than that of foreign trade, giving weight to the idea that a growing percentage of the volume is accounted for by dealing for speculative purposes. This has led a number of commentators to argue that the market is becoming intrinsically unstable. The view is characterised by one economist, who says:[5]

> 'These [foreign] exchange transactions began as a means to smooth and facilitate the flows of traditional trade and investment. But this FX 'tail' has grown to be some hundred times larger than the original trade 'dog' . . . FX is a speculators' paradise.'

This does not take account of an alternative view, that the broadening and deepening of the FX market has allowed market participants to protect themselves against over-exposure by trading with other dealers. In this view, the increased volumes in the FX market simply reflect prudent behaviour on the part of dealers.

Whatever view is correct, the question remains whether the expansion of the market has been stabilising or destabilising. As movements in foreign exchange rates have become larger and more rapid—and with events such as those which followed 'Black Wednesday' (16 September 1992)—there have been calls from some authorities and a number of economists to impose some sort of control or restriction on the market. These have been reinforced by events such as the Swedish government's inability to maintain the level of the krona, even by raising overnight interest rates to 500%, and the depreciation of the lira.

Before considering such calls, however, it is worth examining what recent economic theory has to contribute to understanding these developments in the FX market.

There are a number of questions to be answered. Have the globalisation and increase in volumes in the FX market *of themselves* increased the volatility of exchange rate movements? Are exchange rates less linked to 'fundamentals' than they were, or have the fundamentals themselves changed? If there is less of a link to fundamentals, does that mean that dealers are behaving *irrationally*? In particular, are the large exchange rate movements evidence of irrationality or could they in fact reflect rational behaviour by participants? Would the introduction of 'frictions' into the market reduce the volatility of price movements?

I argue in this article that the increasing size and connectivity of the FX market may have led to increased

(1) Alan Kirman is Professor of Economics at the European University Institute in Florence.
(2) The Houblon-Norman Fund, established by the Bank in 1944, finances academic research into subjects relevant to central banking. More details of the Fund were given in an article in the August 1993 *Quarterly Bulletin.*
(3) The figures here are taken from 'Central bank survey of foreign exchange market activity', a document from the Bank for International Settlements' Monetary and Economic Department, Basle, February 1993, pages 1–42.
(4) Source: 'The foreign exchange market in London', *Quarterly Bulletin*, November 1992, pages 408–17.
(5) From Ohmae, K, *The borderless world*, Harper Business, New York 1990, quoted in Zaher, S, 'Market-makers: A study of the effects of global market integration in the currency trading industry', monograph, School of Management, University of Minnesota, 1994.

volatility. In addition, however, the structure and organisation of the market have to be understood as playing an important role. Recent economic theory, which takes account of the fact that individuals draw information from the actions of others in the market and may imitate the successful, suggests that 'herding' or 'informational cascades' may occur. Nevertheless, this sort of behaviour is by no means necessarily irrational and should not be attributed to some inexplicable market psychology.

Thus both those who argue that the foreign exchange market is now more efficient at revealing underlying imbalances in fundamentals and those who maintain that the intrinsic dynamics of the freer and more open markets have led to greater instability can find comfort from theory and empirical evidence.

One associated argument is as to whether the volatility of markets could be reduced by the introduction of frictions, such as a tax on FX transactions. On this, I suggest that in the light of the evidence we would do better to use our improved understanding of the dynamics of foreign exchange markets, and of the role of their microstructure, to increase the efficiency of interventions to help maintain a certain orderliness, rather than impose restrictions on transactions.

In order to answer the questions posed above, it is necessary to outline the standard, 'efficient markets' model of the foreign exchange market, which suggests that prices should be linked rather strictly to fundamentals and therefore that the globalisation of financial markets should not radically affect prices. I then mention some empirical paradoxes and look at various reasons why this basic model has been questioned, and at whether alternative models offer better explanations of the facts.

The standard efficient-markets model

The behaviour of asset prices in general—and foreign exchange rates in particular—is typically explained by economists by *efficient-market* theories. This term, although used in different ways, basically reflects the following ideas.

The price of an asset should reflect underlying 'fundamentals'. Thus in the case of a stock or share, its price is supposed to reflect the discounted value of all dividends expected in the future and the value of the firm at the end of the life of the claim, if it is for a fixed term.

Secondly, the link between fundamentals and prices is such that all information available about fundamentals—both public and private—should be incorporated into prices. If this is the case, then the only reason for prices to change must be the arrival of completely new information which was not predictable. (If it had been predictable, it would have been predicted.) Hence asset prices must appear to fluctuate randomly; whether they do has been the subject of extensive debate.

In the case of exchange rates, the efficient-market hypothesis has to be rephrased. Suppose that assets are priced efficiently—in the above sense—in two different countries. Then changes in the exchange rate should effectively equalise the rates of return in both countries: this is so-called 'uncovered interest parity'. It can be objected to on the grounds that it does not take account of the risk involved in such transactions. However, using the forward market allows us to make a risk-free transaction and the forward exchange rate should equalise the rate of return. This is the 'covered interest parity' condition.

In either case, we are back to the original idea: fundamentals determine the rates of return in each country and exchange rates adapt to these. Thus modifications in exchange rates reflect changes in fundamentals. And changes in fundamentals will lead to compensating changes in exchange rates.

One important feature of this approach is that asset values or exchange rates reflect what is *expected* to happen to fundamentals. Since expectations are not measurable, it is clearly not possible to falsify the efficient-market hypothesis directly.

Problems for the efficient-markets model

Yet many of the facts about financial markets seem to be at odds with this kind of theory. Perhaps the most striking is the volatility of asset prices, compared with that of the underlying fundamentals. Despite numerous efforts by economists to explain it, the 'excess volatility' puzzle remains. Why should it be in the case of stocks, for example, that prices are so much more volatile than the associated dividend streams?(1) Once again, it can be argued that the relationship between fundamentals over time is highly 'non-linear' and that small changes in today's values may lead to large changes in the future, thus significantly changing the current price. It is difficult to believe, however, that there could be a sudden change in the fundamentals which would lead agents simultaneously within half a day to the view that returns in the future had gone down by over 20%. Yet this is what would have to be argued for the October 1987 episode on the New York Stock Exchange.(2)

The same is true for sudden and substantial changes in exchange rates. Do they really simply reflect modifications in expectations about future fundamentals? Why does the volatility of exchange rate changes vary over time? How does one reconcile the two ideas frequently expressed by traders, that on the one hand 'fundamentals matter in the long run' but on the other they do not drive exchange rates in the short run?(3)

(1) See Shiller, R J, *Market volatility*, Cambridge Mass: MIT Press, 1989.
(2) Indeed Miller has suggested that substantial changes in the future can result from very small changes in the present, and that such an explanation is not inconsistent with the Crash; see Miller, M H, *Financial innovation and market volatility*, Blackwell, 1991.
(3) See Goodhart, C A E and Figliuoli, L, 'Every minute counts in financial markets', *Journal of International Money and Finance, 10*, pages 23–52, 1991.

Two things have to be observed before these questions can be addressed. Firstly, changes in prices or exchange rates reflect changes in economic agents' *perceptions* of the future, and not necessarily what will actually occur. Secondly, a clear corollary of the efficient-markets view is that if asset prices change without any obvious change in the fundamentals, some agents must be acting irrationally.

For this reason the sort of empirical puzzles mentioned are frequently explained in terms of market psychology. The implication is that the movements involve some degree of irrationality on the part of those participating in the markets. Sudden changes or departures from fundamentals are taken not as evidence of the inapplicability of efficient-market theories but rather as evidence of a failure of investors or traders to act as rationally as those theories require.

To take an example, in his classic book on market volatility Shiller refers to alternative explanations of price movements as being associated with 'capricious' behaviour or as being 'for no good reason'.(1) His argument to explain 'excess volatility' is that investors may take actions as a result of a movement in asset prices which result in a further change in prices; a sequence of such events may lead to a 'price bubble' which detaches prices from fundamentals. Despite his insistence on the importance of this behaviour, Shiller seems to emphasise the irrationality of such self-induced price movements.

Before considering the argument about irrationality, however, a basic point has to be made. There is no clear consensus concerning the nature of the relationship between fundamentals and prices in many financial markets. In the foreign exchange market, most participants believe in the existence of a relationship between exchange rates and certain macroeconomic fundamentals. But such a relationship is difficult to estimate and may well not be invariant over time, even if one knew which macro variables were important. Thus even without any shock, it is easy to see that there is a potential source of instability. If traders or participants in the market change their view about the nature of the relationship—or about the particular macroeconomic variables which are important—they may, by their very actions, modify the relationship and make it self-fulfilling.

The well known literature on *sunspots* makes this point in an even more striking way.(2) If market agents believe that prices are correlated with sunspots, they will buy and sell accordingly and, as a result, prices will indeed become coordinated with sunspots. Yet one could ask how would this come about, and it can be shown that sensible agents using sensible learning rules may come to believe in the importance of sunspots and that their beliefs will be self-confirming.(3) Thus movements of exchange rates which are not directly correlated to movements in fundamentals are not necessarily the result of irrationality.

An alternative kind of model

What Shiller does show, despite his comments on the irrationality of such behaviour, is the importance of agents' reactions to one another's behaviour. The important point to make is that in financial markets agents do indeed interact directly with one another and not only indirectly through market prices. This apparently innocent remark has significant consequences for the aggregate behaviour of markets. Instead of thinking of a single 'typical' economic agent's response to events, one should consider individuals in a market as not necessarily being homogeneous, and as observing and anticipating the behaviour of other participants. Once one does this, it is much easier to see how a common view can take over a market temporarily and then be replaced by another view.

Once we consider the market as a complex interactive system in which heterogeneous agents with different horizons and different attitudes to risk participate, the price dynamics can be very different from those of more conventional models. Although this sort of idea is familiar to mathematicians and physicists—a number of whom are now employed by major financial institutions—it has only recently influenced the development of economic models of financial markets.

Such ideas are, on an informal level, far from new. In economics, Keynes' beauty contest example has been frequently discussed. Keynes' point was that in deciding which contestant would win a beauty contest one should not take into account one's own judgment, but rather should try to assess which of the candidates was likely to be most pleasing to the judges. The argument can be extended to a situation in which there is a popular vote to decide the winner. And the reasoning can be used in the case of financial markets. Keynes made the point that trying to act with the majority was important for a manager of funds: he or she is less likely to be criticised for making an investment which turns out to be unprofitable if many other market participants made similar investments than if it was purely the result of his or her own judgment.

Arguments such as those of Keynes, while frequently evoked and suggesting that it is not necessarily irrational to 'follow the herd', have until recently been largely anecdotal. However, the particular argument underlying the beauty contest example has now been developed formally,(4) and in the context of a principal-agent relationship it can be shown that agents who invest on the part of others may have strong incentives to imitate the actions of the market participants that they observe. The idea is a simple formalisation of Keynes' notion that sanctions are asymmetric and in this case the agent will have every interest to conform. Yet this may well result in conformity of a sort which is not efficient from a welfare point of view.(5) However, conformism as a

(1) See Shiller (*op. cit.*).
(2) See Cass, D, and Shell, K, 'Do sunspots matter?', *Journal of Political Economy, 91*, pages 193–227, 1983.
(3) See Woodford, M, 'Learning to believe in sunspots', *Econometrica, 58*, pages 277–307, 1990.
(4) See Sharfstein, D S, and Stein, J C, 'Herd behaviour and investment', *American Economic Review, 80, 3*, pages 465–79, 1990.
(5) The same sort of thing can occur when firms who adopt a technology provide a positive effect for other users of the same technology; a whole industry can get locked into an inferior technology. See Arthur, W B, 'Competing technologies, increasing returns and lock-in by historical events', *Economic Journal, IC*, pages 116–31, 1989.

form of risk aversion is but one of several explanations of why individuals may be influenced by the actions or opinions of others.

It is important to take account not only of the interaction between agents but also of *how* that interaction takes place, and which individuals interact with—or react to—which others. That will depend on the way in which the market is organised; and there is a growing interest in how market microstructure affects the evolution of prices.(1)

Of course, those who maintain the market-efficiency point of view could argue that if different structures give rise to different prices, some of these structures must be unsatisfactory from the point of view of economic efficiency. Empirically though, it may be very difficult to establish this.

All of these arguments suggest that a satisfactory model of financial markets should include the following features:

- Agents should react directly to one another's behaviour.
- The heterogeneity of agents—in terms both of expectations and horizons—should be included.
- The market microstructure, in particular the network of communications within which agents operate, should be considered.

The remainder of this section looks at each of these points and presents a simple example of an economic model which incorporates such features to see how its behaviour compares with the empirical data.

Inferences from the behaviour of others

One of the most important features of markets is that the actions of individuals reveal something about the information that they possess. This feature is poorly incorporated in most economic models and difficult to include in the efficient-markets framework.

To take a few examples that economists have considered, let me look first at the case in which agents receive private signals but also observe the choices made by others. So in the foreign exchange market, in addition to any information acquired from a private source, a trader observes what other participants are doing—or at least proposing to do. If the agent changes his action in the light of this information, a so-called 'information cascade' arises.(2) As more and more individuals act in this way, a trader would have to have almost unbounded confidence in his own information not to conform, particularly if such cascades lead to self-fulfilling outcomes.

In the FX market, a trader's goal is to anticipate the direction of movements in market prices, so he or she gains a great deal of information by listening to the brokers, watching the bid and ask prices on the screens, and telephoning other traders to ask for a quote. Each piece of information modifies the individual information set, but since there is no central equilibrium price this information cannot be incorporated and become public through that price, but only through the observable actions of the individual. The problem with information cascades is that as the number of people involved increases, the cascade reinforces itself. Although quite fragile to start with, cascades later become almost immune to relevant information.

There is a significant loss of efficiency here. The information acquired by early agents would be of use to their later counterparts, but if they choose to follow what others do this information is not made available. In this way, possibly relevant information about fundamentals, for example, might never be used and prices could get detached from these fundamentals. A conclusion that can be drawn from work by a number of economists is that the information obtained by observing the actions of others can outweigh the information obtained by the individuals themselves. It is also clear that as the behaviour of market participants becomes more and more instantly observable—with the development of modern communication technology—the probability of cascades is increased.

Imitation

A second source of herd behaviour is the tendency to imitate those who are successful. This can occur in two ways. Either individuals may be converted to the beliefs held by their successful counterparts, or they may simply imitate directly the choices of the successful. This, in itself, might merely imply a learning process which would lead less successful participants to improve their performance. However two things can happen. An individual may become successful as a result of some chance event, or series of chance events. The fact that he is then imitated may lead to the market moving in the direction he predicts, or it may end in a collapse of what will become apparent was a bubble. It is possible indeed that imitation of success will lead to perpetually changing patterns of behaviour in the market.(3)

Market microstructure: network effects

The way in which a market is organised can have important consequences for the way in which prices evolve. In a market in which there is no centralised price determination, agents will trade with and observe other traders. But traders do not pay equal attention to all the other traders operating in their currencies. Typically, they operate with a limited subset of partners and there are clear reasons for this, in terms of the time cost of monitoring and communicating with others. So the market may be viewed as a complex

(1) See O'Hara, M, *Market microstructure theory*, Cambridge Mass: Blackwell, 1995.
(2) See Hirschleifer, D, 'The blind leading the blind: social influence, fads and informational cascades', *Finance Working Paper No 24–93*, School of Management, UCLA, 1993; Bikhchandani, S, Hirschleifer, D, and Welch, I, 'A theory of fads, fashion, custom and cultural change as informational cascades', *Journal of Political Economy, 100*, pages 992–1,026, 1992; Banerjee A, 'A simple model of herd behaviour', *Quarterly Journal of Economics, 108*, pages 797–817, 1992; Welch, I, 'Sequential sales, learning and cascades', *The Journal of Finance, 47*, 1992; and Kirman, A P, 'Communication in markets: a suggested approach', *Economics Letters, 12, No 1*, pages 101–8, 1983.
(3) See Ellison, G, and Fudenberg, D, 'Rules of thumb for social learning', *Journal of Political Economy, 101, No 41*, pages 612–43, 1993.

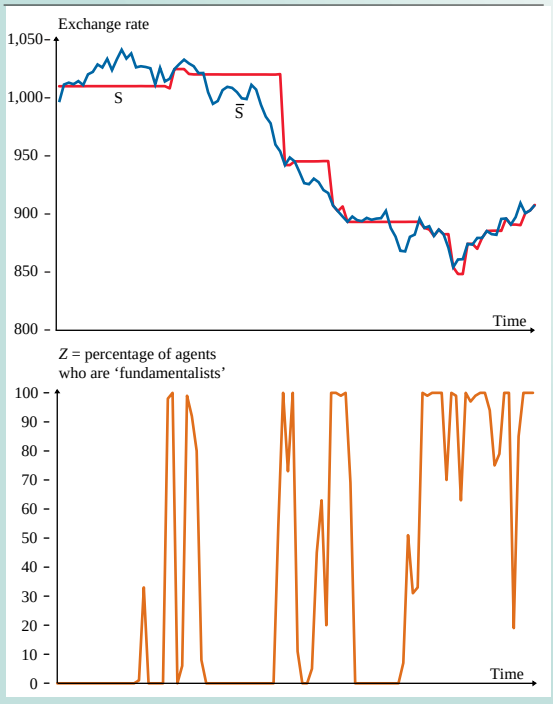
A simple example

This example illustrates how some of the features discussed can be incorporated into a model of a financial market. Consider a simple situation in which opinions in the foreign exchange market are divided between those who are *chartists*—ie who extrapolate prices in a more or less sophisticated way—and those who are *fundamentalists*, who believe that prices are essentially determined by underlying fundamental values.(1) As people meet each other in the market (where 'meet' may mean observing an action, making a telephone call or receiving a signal), they will be influenced by the expectations of those they meet, and will be recruited to another's opinion—if different from their own—with a certain probability. Clearly if they keep meeting or observing individuals who share their own opinions, these can only be reinforced. Thus the proportion of people in the market holding a certain opinion will fluctuate as a result of the sequence of meetings that take place.

Individuals then try to assess what the majority expectation is and make their bids accordingly. And the exchange rate is then set to clear the market.

What can be shown in such a simple model is:(2)

- that the proportion of opinions will never settle down, but will continually change;
- at any time, the individuals will be nearly all chartists or nearly all fundamentalists, but periodically the market will switch from being dominated by one to being dominated by the other; and
- that although a market currently dominated by chartists will always return to fundamentals, the time at which it will do so is indeterminate.



A simulation of such a model is shown in the chart. Z is the percentage of agents who act as fundamentalists, S is the exchange rate and $\overline{S}$ is the exchange rate were it to be completely determined by fundamentals. What can clearly be seen is that the exchange rate S moves away from $\overline{S}$ for a while and then returns sharply. The example has been constructed so that periods of chartist domination maintain the exchange rate constant. This has been done in order to make the figure more readily interpretable, but is just an artefact of the parameters.

Three things are worth noting:

(i) The equilibrium of such a market should be thought of in terms of the so-called 'limit' distribution—the proportion of time the system spends in each state.

(ii) In the model, 'herd behaviour' is rational—in that it is more profitable to act with the majority, particularly if it is known that others do so.

(iii) Individuals do not systematically make mistakes but switch opinions and are justified in doing so, since most of the time their expectations are self-fulfilling.

These features are clearly heavily dependent on the assumption that decisions take place—and expectations modified—in a sequential way. This, however, seems to be an appropriate assumption, given the way in which the FX market works. The rapidity with which meetings, conversations and observations occur in the modern FX market would, of course, have a significant impact on the time it takes to switch from one extreme to the other. *Ceteris paribus*, the more frequent these meetings, the more frequent the change of 'regime'.

Such a model enables one to formalise the idea that in the short run a movement may persist, even though it seems to run counter to what the fundamentals would indicate. Since no information is to be gathered from how long one has been in one state as to when opinions in the market might shift, there is little to be gained from taking a position on the basis of a return to fundamentals at some indeterminate time in the future. This is particularly important since 90% of FX volume is accounted for by intra-day, ie short-term trading.

It is also worth noting that econometric standard tests as to whether the movement of the exchange rate is a random walk—which is what it would have been had it always followed fundamentals and thus satisfied the 'efficient-market' criterion—failed to detect the presence of strong deviations from the fundamentals. So these tests do not seem capable of detecting the presence of bubbles in a series which for part of the time follows a random walk. Furthermore well-known tests for time-dependency in the volatility of the series (ARCH, GARCH, etc) did not reject the presence of such an effect, despite the fact that—by construction—the sort of time structure these tests are supposed to detect was not present in this model.

(1) For a similar model, see Frankel, J A, and Froot, K A, 'The dollar as an irrational speculative bubble: the tale of fundamentalists and chartists', *Marcus Wallenberg Papers on International Finance*, *1*, pages 27–55, 1986.
(2) For details, see Kirman, A P, 'Ants, rationality and recruitment', *The Quarterly Journal of Economics*, *108*, pages 137–56, February 1993; and 'Testing for bubbles', *mimeo*, European University Institute, Florence, 1994.

network, with each participant being linked to a subset of others. Not all of these links will be in use at any one time and indeed they will be used with a certain probability, depending on the terms offered and the positions held by the various partners. Thus the market can be viewed as a 'stochastic or random graph'—*graph*, since traders are linked with certain other traders; and *random*, since these links are only used with a certain probability.(1)

The connectivity of this network will be of considerable importance for the transmission of information and for the speed with which a particular view takes over in the market. One thing that is known is that if the probability that any two agents in the market are in contact with each other is not too small, the larger the market the faster information will disseminate. Why is this true?

Suppose that there are N individuals in the market. These individuals trade with or observe only a limited number of others. Thus the reaction by other agents to an action of one will not be instantaneous, but will take place only when one of the agents with whom they are in contact reacts. The reaction will 'percolate' through the system. Assume, for example, that each of the agents observes $\sqrt{N}$ others, ie in a market with 900 participants each individual observes 30 of his counterparts, which does not seem unreasonable. One can show that, if agents do this and N is large, it will take only two steps before every agent is alerted to the fact that an action has taken place.(2)

So, perhaps counterintuitively, epidemics or herd behaviour are more likely to develop rapidly when there are many agents in the market. Two things offset this, however. Traders are not all linked with equal probability to others. The global market is, in fact, still quite strongly segregated into three regions: Asia, Europe and North America. There are troughs of activity at around 4.00 am GMT and between 7.00 pm and 11.00 pm GMT as regional markets open, close or diminish activity. This, together with the second observation—that currencies tend to be traded more specifically in their own markets—probably slows down the transmission of reactions, and may diminish the effect of any particular local movement. (Globalisation may, in this sense, be destabilising if it leads to more integrated markets.)

Although it is clear that the network of communications that traders use is important, what is more difficult to analyse is how the structure of the network develops in the first place. How do traders choose their partners? Why do the probabilities of trading with others evolve away from the uniform situation? Although economists are now paying some attention to this sort of question,(3) little formal analysis has been done. A typical feature that has to be explained is the advent of traders or clients who become the focus of attention of many members of the networks. Their actions are closely monitored and often imitated for a period, and then the links to them become less important as attention switches elsewhere.

Market microstructure: organisation and prices

In the standard efficient-markets view, little attention is paid to precisely how the market is organised. Thus the particular microstructure of a market is assumed not to have an impact on the evolution of prices. Yet a number of empirical observations bely this. Markets which are organised on an auction basis do not, in general, exhibit the same price behaviour as those for the same product organised on a posted-price basis, or with bilateral deals. Indeed considerable attention is paid by governments, for example, as to which mechanism to use when selling government bonds and privatising public enterprises.(4) This is precisely because the mechanism chosen will affect the prices obtained. So the prices obtained do not simply reflect the underlying 'fundamental' value of the assets or goods being sold, but also the choice of mechanism used to sell them.

In the FX market, there are dozens of market-makers all simultaneously announcing bid and offer prices at which they are prepared to trade in particular pairs of currencies. Even though these prices are posted on screens, at any point in time there will be a dispersion of prices available and transactions will often take place at the same moment in the same currencies at different prices. The explanations for this are clear. It is not possible for traders to keep track of all prices simultaneously, the prices announced are indicative, actual transactions will often take place within and not necessarily at the announced spread, and the prices offered by market-makers, announced by brokers and revealed by electronic broking systems are constantly shifting.

The way in which prices evolve is not the same as it would if there were a central auctioneer who periodically set prices to clear existing bids and offers.(5) Each market-maker's action will depend crucially on his time horizon. If he is 'hit' too often on one side, he will start to acquire a short or long position; this has two consequences. Firstly there is now a substantial element of risk involved and secondly he is acquiring a position which—for most market-makers—has to be closed by the end of the day. Both features will cause the market-maker to modify his prices and possibly his spread. If all trades were between market-makers, for every such movement there would be a countermovement. Even this would not necessarily eliminate any change, since the reaction of the two agents to the trades they had just effected might not be symmetric. In fact, of course, a number of the trades are motivated by outside orders.

The standard argument is that all this is irrelevant to the economist or actor such as a central bank, who is interested in observing and predicting the way in which prices move.

(1) For a simple example of the application of this tool to economics, see Kirman (*op. cit.*).
(2) This rather simplified explanation is based on a mathematical result of Bollobas.
(3) See, for example, Stanley, E A, Ashlock, D, and Tesfatsion, L, 'Iterated prisoner's dilemma with choice and refusal of partners' in *Artificial Life III*, Ed Langton, C G, Santa Fe Institute Studies in the Sciences of Complexity, proc. vol. XVII, Addison-Wesley, 1994.
(4) In general, the simple aim is to maximise revenue subject to certain distributional or 'fairness' constraints.
(5) In fact in some countries there are daily 'fixings' but these only involve a small volume of trade.

The process is analogous, it is argued, to that of a Walrasian auctioneer. If one currency is being sold then those with the highest bids will be hit first, their bids will fall and other participants with lower bids will be hit until the market is back in equilibrium.

But the essential point is that the dynamics of price movements are more complicated than this, for two simple reasons. Firstly if a transaction is observed to take place, it provides information to other market-makers, and this fact alone may cause them to modify their own bids and offers. Furthermore it also provides information to those who place orders with market-makers and their demand may be affected by this information. The identity of the person making the transaction (or on behalf of whom the transaction is being made) may also convey information.

So depending on the way in which a transaction is carried out, the information revealed will be different. Central banks are, of course, well aware of this and can choose, in consequence, whether to intervene openly or to do so in a less detectable way. The significance of this is that their impact on prices will be different depending on their behaviour and not on the fundamentals.

Lastly, as has been mentioned previously, the particular structure of the network of communications within the market and its connectivity will have a significant impact on the way information is transmitted and thus on the evolution of prices.

For all these reasons, the microstructure of the market cannot be ignored when trying to understand the nature of price formation in the FX market. Two aspects of the microstructure must be emphasised. Firstly it will determine how the heterogeneity of opinions or positions of agents are translated into prices and transactions, and secondly it will determine how—and how quickly—information will be transmitted.

Implications of interaction for price dynamics

Before considering the impact of the sort of phenomena discussed above, it is perhaps worth mentioning what is meant by price here. A lot of interest has been focused on high-frequency, or 'tick by tick', data. Each observation is the average of the bid and ask of the indicative quote in question. If the market is adjusting in one direction, the level of the prices will be misleading but the direction of the change will not.

If the market were operating as efficient-market theory says it should and each quote corresponded to the equilibrium price, then there should be no *auto-correlation* between price changes, ie no correlation between successive changes.

However if—as seems more likely—the market adjusts through a series of transactions in response to quotes, then one would expect positive auto-correlation, that is the change in one period is likely to be in the same direction as that in the next. Such a pattern would also be consistent with the sort of herd behaviour I have mentioned.

At the highest frequency, however, auto-correlation is actually negative.(1) This may be a result of looking in *too* great detail at the price series. In fact agents have heterogeneous horizons and may have different expectations. For example, some traders may not be allowed to hold open positions overnight while others will be taking positions on a much longer-term basis. When the market is unsettled, opinions may vary as to the direction of price changes even in the short run. As a result, successive trades will not necessarily be in the same direction. It has also been observed(2) that since different banks offer different spreads, prices may bounce back and forth, for example at the start of a movement from one expectations regime to another.

If we couple together two features of the sort of models discussed above—the different horizons of the agents and the emergence of speculative bubbles—we would have a situation in which volatility would be time-varying, but shorter-term and longer-term volatility would be linked. An initial switch would be transmitted to those with different horizons and would trigger off actions by a large number of market participants. In fact this is precisely what happens in the foreign exchange market: there is correlation between longer-term and shorter-term volatility, but not, for example, between successive observations of short-term volatility.(3)

There is by now a substantial literature on the detection of the time structure of the volatility of foreign exchange rates. Some success has been reported using ARCH, GARCH and more sophisticated versions of these tests.(4) The evidence is far from conclusive and indeed in the simple example discussed in the box on page 290 these tests failed. Nevertheless the total absence of structure in the time series of exchange rates—which the efficient-markets model would suggest—is not borne out by the evidence, and the effort being put into developing and testing trading rules based on the structure of the stochastic process generating exchange rate movements suggests that many market participants realise this.

Although trading rules based on the extrapolation (however sophisticated) of past prices have not been accorded much interest by academics with the exception of two centres,(5) the same is not true for major financial institutions who, according to a recent survey, almost all use 'technical analysis' in their forecasting. Indeed Brock *et al* have shown that even relatively simple 'technical' rules based on the

(1) See Guillaume, D M, Dacorogna, A M, Davé, R R, Müller, U A, Olsen, R B, and Pictet, O V, 'From the bird's eye to the microscope: a survey of new stylized facts of the intra-daily foreign exchange markets', *O&A Research Group Discussion Paper*, 1994.
(2) See Bollerslev, T, and Domowitz, I, 'Trading patterns and prices in the interbank foreign exchange market', *The Journal of Finance, 48*, pages 1,421–43, 1993.
(3) See Guillaume *et al (op. cit.*).
(4) See for example Chiandotto, B, and Gallo, G, Eds, *In Quest of the Philosopher's Stone*, Società Italiana di Statistica, Florence, 1994.
(5) The University of Wisconsin and the Santa Fe Institute.

differences between short-term and long-term moving averages do have some predictive power and therefore are profitable.(1)

Such evidence would seem to be consistent with the sort of stochastic model I have mentioned; the rules would be picking up the changes in prevailing expectations. All of this suggests that the data from the FX market share some of the features of a stochastic model of changing expectations regimes—periods of calm interspersed with periods of higher volatility, and periodic switches from one type of expectation to another.

Would the introduction of friction stabilise the market?

A number of economists have called for the imposition of some sort of globally applied tax on trading. Apart from the difficulty of implementing such a measure, two recent arguments related to the alternative models discussed above suggest that such a measure might be counterproductive.

The first is that since individuals convey information when they act, the introduction of a tax would mean that the signal given by an action might, when individuals act less frequently, be regarded by others as more important and more informative. This is simply because, since the cost of taking any action has been increased, the profit that an agent expects to make before taking an action must be higher. As a result, those observing will interpret an action as having more predictive value than previously.(2) So although the market may be quieter for longer, it will be more susceptible to large and sudden movements.

A rather different argument is that when the market is quiet and exchange rates are less volatile simple predictive rules are quite effective and will start to take over from more sophisticated and time-consuming predictive methods. But it may be the case that the simple rules are unstable, in the sense that, once perturbed, the exchange rate will not return quickly to some stable value. Suppose for the sake of argument that in equilibrium both methods would predict the same rate, then when sophisticated prediction methods are being used the rate will be robust to perturbations. However, precisely because of the market's stability the simple prediction method will reappear and will, sooner or later, lead to a period of high volatility. With more costly transactions the quiet period may be prolonged, but at the possible expense of experiencing greater volatility when a shock occurs.(3)

Conclusion

What I have suggested is a view of the FX market rather different in nature to that underlying the standard efficient-markets model.

Interaction between agents, in terms of the information that is passed and inferred, plays an important role in determining the dynamics of exchange rates. If the view is correct, the greater flow of information as communication technology develops will lead to more frequent changes in 'market opinion', and the increasing number of participants in the market will speed up the transmission of information between them. This in turn will increase the speed with which different price expectations can come to prevail. These tendencies have led—and will no doubt in future lead—to demands for the introduction of some sort of friction into the market, such as a tax on trading to diminish the volatility of exchange rate movements. In statistical terms, the market characteristics could be modified by the introduction of such frictions into the system. It is true that they would change the distribution of price changes and reduce average volatility. But this would be at the expense of a much larger probability of extreme events.(4)

A particularly interesting feature of the sort of model described is that it allows us to explain two important features of the FX market. Firstly, if there is a view on the part of some market participants that fundamentals are important, eventually this view will come to prevail—at least for a period. But the time at which this will occur is unpredictable. This makes the view that fundamentals are of little importance in the short term but matter in the long run perfectly consistent with the facts.

Secondly, the stochastic element in the communication between agents weakens any direct deterministic link between exchange rates and fundamentals in the short run, and explains why in two apparently similar situations there can be very different exchange rate movements.

The relationship between fundamentals and exchange rates is not well understood and seems to vary considerably over time. Furthermore, exchange rate movements depend on what market participants believe that relationship to be, and this also adds weight to the importance of the role of communication between agents in the market. The tendency of commentators to attribute a particular change to a particular piece of news about fundamentals is not justified by the behaviour of the system. Such explanations may give a plausible account of what happened, but do not enable us to make good predictions about future changes: one can make reasonable 'in-sample fits' but can not make good 'out-of-sample predictions'.

Finally, the view of the foreign exchange market as a complex interactive system with many heterogeneous agents, which undergoes periodic shifts in its state, seems not only to be able to explain some of the characteristics of the actual price dynamics of the market, but also to cohere with some of the stylised facts about the way in which the market actually works.

(1) See Brock, W A, Lakonishok, J, and Le Baron, B, 'Simple technical trading rules and the stochastic properties of stock returns', *Discussion Paper, University of Wisconsin*, Madison, 1991.
(2) This argument has been put in Caplin, A, and Leahy, J, 'Business as usual, market crashes and wisdom after the fact', *Harvard University Economics Department, Discussion Paper No 602*, 1992.
(3) This argument is developed in Brock, W A and Hommes, C, 'Rational paths to randomness', *mimeo*, University of Wisconsin, 1994.
(4) See Guillaume *et al* (*op. cit.*), who observed that this characterised the EMS record when bands were narrow.

Banking statistics review: summary of responses

An article in the February Bulletin[1] *listed the main bids for new or different monetary and banking statistics of which the Bank was then aware, and invited comments from users. As well as appearing in the* Bulletin, *the article was sent to 46 people and institutions thought to have a particular interest in monetary and banking statistics. This short report summarises the main points from the responses received.*

The Bank received 17 responses, from City representative organisations, City and academic economists, and the Statistics Users' Council. Generally, the responses provided support for items already on the list of bids rather than adding materially to it. The main requests were:

- There was support from several City and academic institutions for more data on interest rates and credit conditions more generally.

- Several respondents welcomed the new monthly series on personal borrowing; two, including the Council of Mortgage Lenders, requested extra detail (eg data on repayments to banks of principal of secured lending).

- The proposals for a monthly series on personal sector deposits (especially for use in a monthly Divisia money series) and for an industrial analysis of deposits (as well as the existing analysis of lending) were each supported by one respondent.

- Two respondents mentioned the potential usefulness of splitting company sector data (eg on borrowing, interest rates and income) by size of company, and one said that a similar split of the distribution of debt among households would likewise provide insights into the transmission mechanism of monetary policy. Another respondent said that information on the *use* of borrowed funds would be helpful.

- Two respondents said that more detailed data on banks' capital would be useful, and one of these said also that more data on off balance sheet business and the income generated by it would be of interest.

- British Invisibles said that it would be helpful if any changes to banks' reporting could facilitate a geographical split of invisibles business in the balance of payments; they also expressed a preference for improvements to the existing quarterly balance of payments statistics, rather than development of a monthly series.

Many of the respondents commented favourably on the value of the existing statistics. Several suggested some—generally minor—changes in their presentation or increases in the amount of detail published; two wondered if there was scope to reduce them. The Statistics Users' Council suggested that a user group on financial statistics be established; the Bank is considering this proposal with the Central Statistical Office.

The Bank is grateful to all who responded to the article, and is replying to them individually. Their views have been taken into account in the preparation of the list of bids for new statistics which is now being discussed with the British Bankers' Association, though (as mentioned in the February article) it is likely that only those bids with a strong justification will be able to be met readily.

(1) 'Banking statistics: recent and prospective developments', *Quarterly Bulletin*, February 1995, pages 72–76.

The prospects for monetary stability

*The **Governor** welcomes[1] the Government's clear restatement of its objective of permanently low inflation as the essential contribution that monetary policy can make towards achieving steady and sustained growth of output and employment over the medium and long term. He looks at recent international and domestic developments which are part of current policy judgments, and concludes that there is a real opportunity to make a decisive break-through to permanent stability.*

It is a fact of modern life that all of our financial institutions are today subject to continuous external, as well as internal, scrutiny. That is no doubt how it should be. It ensures that we remain on our toes and keep up with the times in the new world of global financial competition. But it should not be allowed to obscure our successes. The facts are that £12 billion in new equity was raised through the Stock Exchange last year—twice the average of the previous four years; the Stock Exchange last year had turnover of £300 billion in domestic equities—twice the level of four years earlier; and London has a higher proportion of international equity trading than any other centre anywhere in the world. I should like this evening to congratulate the Stock Exchange on that success which I am sure will continue.

On this occasion last year, My Lord Mayor, I was able to report to your predecessor that the British economy was in its third year of expansion and that, for only the fourth time since 1970, the rate of growth in the preceding year had exceeded the rate of inflation. I can do better than that this evening. The economy is now into its fourth year of expansion; and we have now had two successive years over which output has grown faster than the rate of inflation.

And I can report to you too that the impetus to expansion over the past year has come from net external trade and to a lesser extent from investment—which augurs well for the sustainability of the expansion—and that unemployment has fallen in each of the past 21 months to almost the lowest level among the major countries of Europe.

The question now, My Lord Mayor, is can we keep this very encouraging performance going?

I don't pretend that it is all plain sailing. On the side of inflation, we have had to contend over the past year or so with a strong adverse tide in the form of higher international commodity prices and an associated increase in input costs to UK producers. There are some signs that this tide may now be beginning to turn. Nevertheless the short-term pressure on producer output prices, and hence on retail prices, remains strong; and it is likely to be aggravated by the fall in the exchange rate earlier this year, after two years of relative stability. Now there is not in fact much that domestic monetary policy can do directly to protect us from these unwelcome developments. But nor can we simply ignore them. Up until now, the cost pressures have been substantially contained by tight control over domestic labour costs and by a reduction in profit margins, particularly on domestic sales. The important concern for policy is to ensure that we do not now begin to see them feeding through more rapidly and setting off the all too familiar spiral of domestic inflation.

How far we can prevent that, looking ahead, depends largely on what happens to overall demand in the economy in relation to productive capacity, and on our monetary policy response. And here the navigational hazard is poor visibility. Looking back, we can be reasonably confident that growth in the economy moderated—as it needed to do—during the course of the past year. But there is some considerable uncertainty as to the current and prospective pace of the expansion. The picture has been complicated for some time by the contrast between the visibly slow growth of demand from the household sector and the buoyancy of the manufacturing sector which has been less widely appreciated. The horizon has been further obscured more recently by doubts about the manufacturing sector itself, with subdued official data apparently telling us one thing and the more robust survey evidence, as well as the current monetary indicators, apparently telling us another.

Poor visibility in these particular waters is not at all unusual, my Lord Mayor. In practice, in the real world, monetary policy judgments are invariably a matter of balancing risks—of weighing probabilities rather than pointing to certainties. However straightforward it may all seem from the outside, those judgments are rarely clear cut. Indeed, given the long lags before policy changes have their full effects, it may be many months before anyone can be confident of the outcome. The Bank certainly lays no claim to divine insight—and nor, I suspect, does the Chancellor.

It is hardly surprising, given the uncertainties, that reasonable people may differ from time to time in the judgments that they make as to precisely what course to

(1) In a speech on 14 June at the Lord Mayor's dinner for the bankers and merchants of the City of London.

steer. The really remarkable thing would be if they always agreed. Indeed that would raise doubts about the credibility of the process.

What is unusual—and I think almost unique—about the monetary policy process in this country is not that those involved in that process can arrive at different conclusions; that is true everywhere. It is that, when they do, both the fact and the nature of the difference are quite deliberately made known to the world through the publication of the minutes. I believe that this transparency is a positive aspect of our arrangements. It promotes wider public understanding of the true nature of the process, including understanding of the uncertainties. It makes the Bank publicly accountable for the quality of its advice, as the Chancellor is accountable to parliament for his decisions. And it represents a check or balance within our constitutional arrangements that can, I believe, help to reduce the risk that we are carried very far off course, in either direction.

But what matters even more fundamentally is that our destination should be clear and clearly understood, not just by all those involved in the monetary policy process but by the public at large. The Chancellor has restated the Government's monetary policy objective—permanently low inflation—quite unambiguously this evening. I very much welcome that—not, as I have repeatedly explained, simply as an end in itself, but as the essential contribution that monetary policy can make towards the true final objective of steady and sustained growth of output and employment over the medium and long term.

The Bank of England will give the Chancellor all the support we can to achieving this goal of permanently low inflation—in particular through our independent assessment of progress towards the inflation target in our quarterly *Inflation Report* and through our independent advice on the policy steps that we judge to be necessary to achieve that target. That is the job we have been asked to do. And it is by reference to the inflation target of 2½% or less—as the Chancellor has confirmed this evening—that we expect our policy advice to be judged.

My Lord Mayor, as I reported at the outset we have made great progress in the past two years towards establishing a more stable economic environment in the United Kingdom. The benefit from this is to be seen in lower inflationary expectations which need nevertheless to fall further to be consistent with our objectives. It is to be seen too in market expectations that interest rates will peak in this upswing at barely half their peak in earlier cycles in the last 15 years. We now have a real opportunity to make a decisive break-through to permanent stability—with all that that means for long-term investment and economic activity. It is an enormous prize. And I look forward to reporting on further progress towards it next year.

In the meantime, My Lord Mayor, let me thank both you and the Lady Mayoress for your most generous hospitality to us all here in the Mansion House this evening. And let me congratulate you both on the way in which you have maintained the best traditions of your high office. You have promoted the financial services of the City of London at home and abroad. You have through your Mayoral theme—the City, Heart of the Nation—helped to ensure that the City's wider contribution to the public good is better understood and appreciated, and you have encouraged the City to play its part in the wider community, for example, through your emphasis on the Lord Mayor's Dragon Awards.