

Markets and operations

This article reviews developments in international and domestic financial markets, drawing on information from the Bank of England's market contacts, and describes the Bank's market operations in the period 1 August to 26 October 2001.

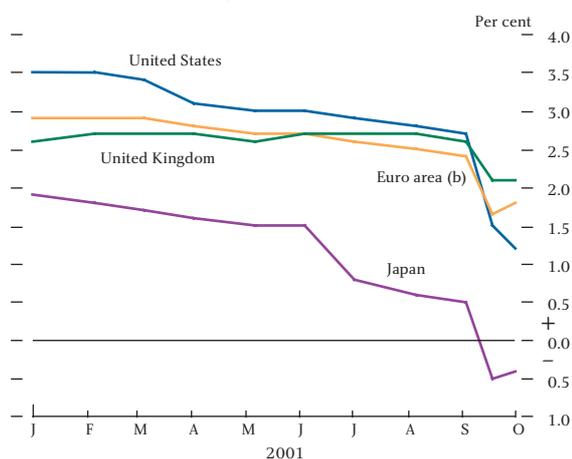
- *The terrorist attacks in the United States on 11 September had only a temporary adverse effect on the functioning of financial markets.*
- *Official interest rates were reduced by 125 basis points in the United States, and by 75 basis points in the United Kingdom and the euro area, and short-term interest rate expectations fell sharply in all three regions.*
- *Long-term interest rates in the United States, the United Kingdom and the euro area fell over the period.*
- *Exchange rate movements among the major currencies were relatively small.*
- *Equity prices fell sharply, especially after the terrorist attacks in the United States, but partly recovered from late September onwards.*

Macroeconomic background to market developments

Market developments were heavily influenced by expectations about economic growth. Private sector growth forecasts for 2002 were generally revised down between early August and early September, and then by more following the terrorist attacks in the United States on 11 September (see Chart 1 and Table A). In particular, there were increased concerns that the US economic slowdown might be more severe than previously thought, with adverse effects on other economies. According to surveys by Consensus Economics, consumer price inflation forecasts for 2002 were revised down for the United States, the euro area and Japan, by 0.3, 0.1 and 0.4 percentage points respectively, but were unchanged for the United Kingdom.

In the two weeks following the terrorist attacks, short-term interest rate expectations and equity prices declined sharply in the United States, the euro area and the United Kingdom, partly due to downward revisions of growth expectations, a flight to quality and liquidity

Chart 1
Forecasts for GDP growth in 2002^(a)



Source: Consensus Economics.

(a) Means of survey samples.

(b) Weighted average for France, Germany and Italy for the interim survey of 25 September.

from equities into short-term fixed-income products, and following monetary policy easing in all three regions (see also the box on market functioning following the events of 11 September on page 382). By contrast, long-term government bond yields rose in the two weeks following the attacks, partly due to expectations of lower tax

Table A
Changes in forecasts for GDP growth^(a)

	13 Aug.–10 Sept.	10 Sept.–25 Sept.	25 Sept.–8 Oct.
2001			
United States	-0.1	-0.5	-0.1
United Kingdom	0.0	-0.2	0.2
Germany	-0.2	-0.2	0.0
Japan	0.1	-0.4	0.0
2002			
United States	-0.1	-1.2	-0.3
United Kingdom	-0.1	-0.5	0.0
Germany	-0.1	-0.6	0.0
Japan	-0.1	-1.0	0.1

Source: Consensus Economics.

(a) Changes between means of survey samples (percentage points).

receipts and fiscal stimulus packages leading to expectations of increases in government bond supply. Exchange rates among the major currencies did not change sharply following the attacks.

Short-term interest rates

During the review period, monetary policy was eased by the Federal Open Market Committee (FOMC), the European Central Bank (ECB), the Bank of Japan (BoJ), and the Monetary Policy Committee (MPC), as shown in Table B. The changes in monetary policy that were announced in the week following the 11 September terrorist attacks took place between regularly scheduled policy meetings.

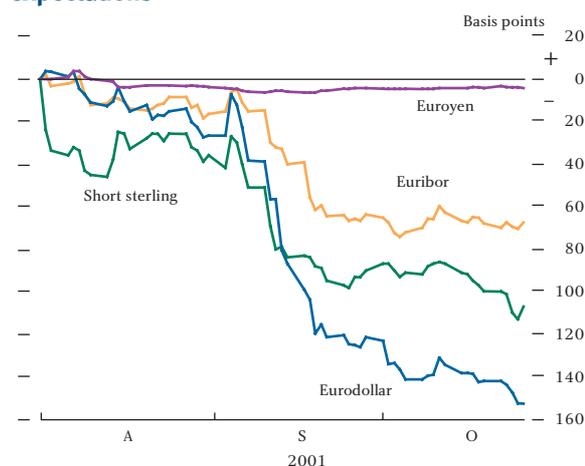
Table B
Monetary policy changes^(a)

FOMC	Reduction in the Federal funds target rate by 25 basis points on 21 August	Reduction by 50 basis points on 17 September	Reduction by 50 basis points on 2 October (to 2.5%)
ECB	Reduction in the main refinancing rate by 25 basis points on 30 August	Reduction by 50 basis points on 17 September (to 3.75%)	
BoJ	Increase in target balances to around ¥6 trillion on 14 August	Change in target balances to above ¥6 trillion on 18 September	
MPC	Reduction in the repo rate by 25 basis points on 2 August	Reduction by 25 basis points on 18 September	Reduction by 25 basis points on 4 October (to 4.50%)

(a) After the review period covered by this article, official interest rates were reduced by a further 50 basis points by the FOMC on 6 November, and by the ECB and the MPC on 8 November.

Short-term interest rate expectations in the dollar, euro and sterling markets fell sharply over the review period, while Japanese rate expectations were little changed (see Chart 2). Between 1 August and 26 October, rates implied by eurodollar, short sterling and euribor futures contracts expiring in 2001 and 2002 fell by about 145–160, 95–130 and 70–100 basis points respectively (see Charts 3 to 5). Japanese short-term interest rate

Chart 2
Cumulative changes in short-term interest rate expectations^(a)

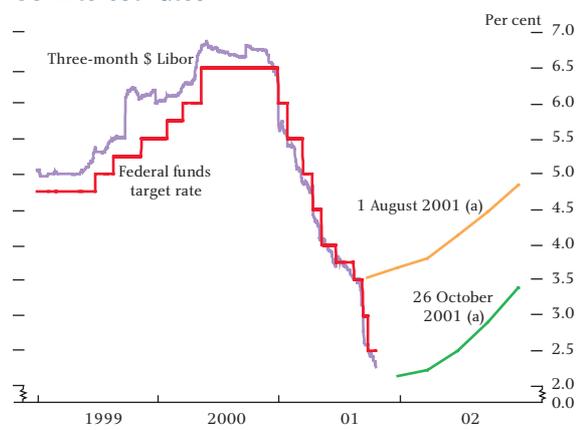


Source: Bloomberg.

(a) As indicated by futures contracts maturing in December 2001.

expectations, which were already quite close to zero, fell by up to 5 basis points (see Chart 6). Downward revision of growth expectations, the terrorist attacks on 11 September and monetary policy decisions were important influences on interest rate expectations, particularly in the United States and Europe.

Chart 3
US interest rates

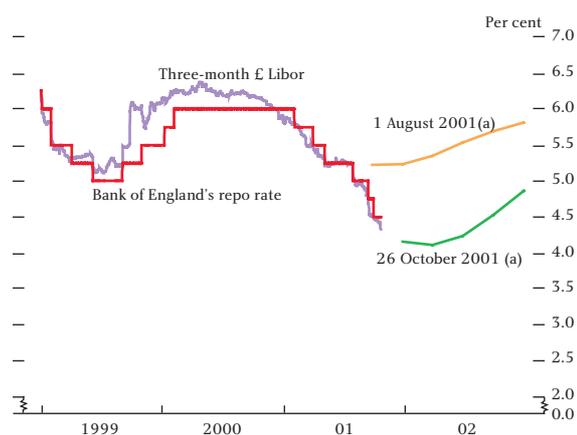


Source: Bloomberg.

(a) Three-month interest rates implied by eurodollar futures contracts at the dates specified. From August 2001 onwards, the x-axis relates to contract expiry dates.

Short-term interest rate expectations fell gradually in August and early September in the United States, the United Kingdom and the euro area (see Chart 2), as economic data releases led to concerns about a deeper economic slowdown than previously expected. Interest rate expectations in all three regions fell particularly following the publication of the Federal Reserve's *Beige Book* in August, the August Philadelphia Federal Reserve Bank survey, and the August US non-farm payroll and non-manufacturing NAPM data, all of which were weaker than expected. In the United Kingdom, rate

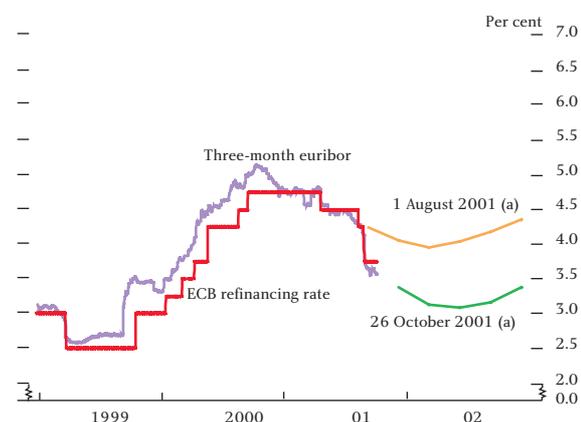
Chart 4
UK interest rates



Source: Bloomberg.

(a) Three-month interest rates implied by short sterling futures contracts at the dates specified. From August 2001 onwards, the x-axis relates to contract expiry dates.

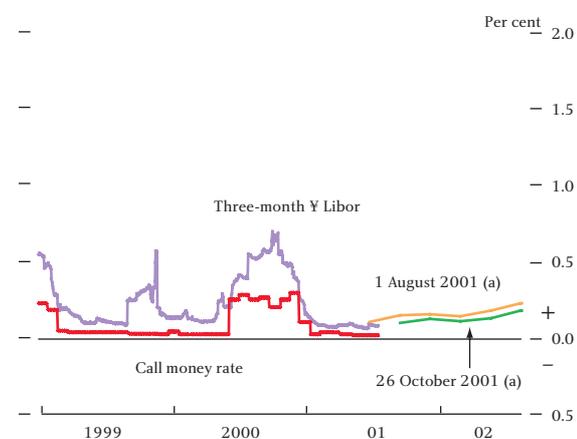
Chart 5
Euro-area interest rates



Source: Bloomberg.

(a) Three-month interest rates implied by euribor futures contracts at the dates specified. From August 2001 onwards, the x-axis relates to contract expiry dates.

Chart 6
Japanese interest rates



Source: Bloomberg.

(a) Three-month interest rates implied by euroyen futures contracts at the dates specified. From August 2001 onwards, the x-axis relates to contract expiry dates.

expectations fell after an unanticipated 25 basis point reduction in the repo rate by the MPC on 2 August, and following weaker-than-expected CIPS services and industrial production data for the United Kingdom. These factors were partly offset by the release of stronger-than-expected US NAPM data for August, and unexpectedly strong UK labour market data for June.

In the two weeks following the 11 September terrorist attacks in the United States, short-term interest rate expectations declined sharply in all three regions (see Chart 2), possibly since the attacks acted as a catalyst in bringing forward in time, and deepening, concerns about a global economic slowdown. Market participants considered that the economic slowdown would not be confined to the United States, and interest rate expectations fell internationally. The monetary policy easings by central banks on 17 and 18 September, in the week following the attacks, reinforced the view that central banks would cut rates as necessary. A flight to quality and liquidity away from equity markets after 11 September (see the section on equities) were also thought by market participants to have contributed to the fall in international short-term interest rates, with portfolio managers switching out of equities and into shorter-term fixed-income products.

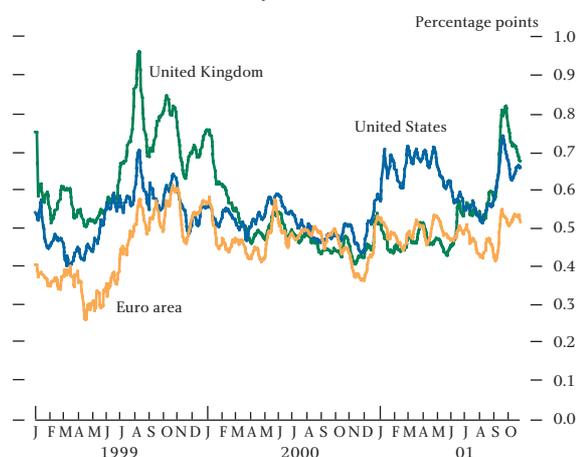
In late September and October, the sharp decline in rates implied by eurodollar, euribor and short sterling futures contracts expiring in December 2001 was halted. This partly reflected expectations that monetary policy easing and fiscal stimulus would contribute to economic recovery in 2002. Also, confidence survey data came in better than had been feared immediately after the attacks, and a decrease in risk aversion and a recovery in equity markets may have led to some reversal of the earlier flight to bond and money market securities.

Monetary policy decisions had a significant impact on short-term interest rate expectations during the period. Rates implied by the eurodollar futures contract expiring in December 2001 fell by 12 basis points following the FOMC's decision to reduce its target rate by 50 basis points on 17 September, suggesting that the change had not been fully anticipated by market participants. Similarly, rates implied by the euribor contract expiring in December 2001 declined by 16 basis points following the ECB's decision to reduce its refinancing rate by 50 basis points on 17 September. Other FOMC decisions during the period also had some impact on

market expectations. Following the FOMC's August and October decisions, interest rates implied by eurodollar futures contracts expiring in December 2001 fell by 6 and 11 basis points respectively. Similarly, the MPC's 2 August decision to reduce the official rate by 25 basis points was not widely anticipated by market participants, and short sterling futures yields for December 2001 fell by 24 basis points following the announcement. By contrast, the MPC decisions on 6 September, 18 September and 4 October had very little impact.

Uncertainty in interest rate expectations, as measured by implied standard deviations⁽¹⁾ derived from options on eurodollar, euribor and short sterling futures contracts, increased over the period at both the three and six-month horizons (see Chart 7). Implied standard deviations started to rise in August and reached a peak following the attacks on 11 September. The rise after 11 September may have partly reflected uncertainty about the economic impact of the attacks and about future official interest rates, but it is also likely to have been influenced at least initially by illiquid conditions in the options markets, particularly for short sterling options. Implied standard deviations rose more strongly in the United States and the United Kingdom than in the euro area; they had fallen back from their peak levels by late October. Short sterling implied standard deviations temporarily rose to levels close to those observed in Autumn 1998 following the Long-Term Capital Management crisis, but remained below the levels reached in the early 1990s.

Chart 7
Interest rate uncertainty^(a)



(a) Implied standard deviations of six-month constant-horizon interest rate futures contracts; five-day moving averages.

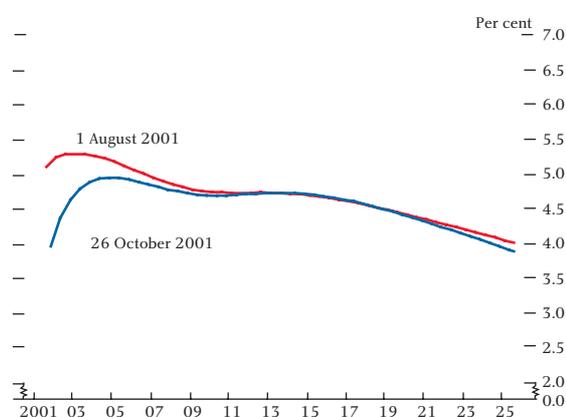
On 26 October, eurodollar and Federal funds futures contracts implied expectations of a trough in the Federal funds target rate at around 2% in 2002 Q1. Short sterling futures contracts implied expectations that a trough in the Bank of England's repo rate of about 4% would be reached by around 2002 Q1. Market participants expected the ECB to lower its official rate by at least 25 basis points by the end of the year, and attached some chance to a 50 basis point cut.

Short-term forecasts for Japanese economic growth were also revised down during the period. These downward revisions contributed to a fall in interest rate expectations for euroyen contracts expiring in 2001 and 2002, which fell by up to 5 basis points. Continued expectations of consumer price deflation, together with a further fall in equity prices, may also have contributed to the decline in rate expectations.

Longer-term interest rates

US, euro-area and UK long-term interest rates fell during the period. Short-dated government bond yields declined sharply (especially following the 11 September terrorist attacks) falling by 70 to 120 basis points over the period as a whole. Medium and long-dated yields fell by less; 30-year US and UK government bond yields declined by around 25 basis points while 30-year Bund yields fell by more than 30 basis points. Reflecting these developments, implied forward short-term interest rates derived from gilts and US Treasuries declined at dates out to around 2010. However, they were broadly unchanged for horizons beyond this point (see Charts 8

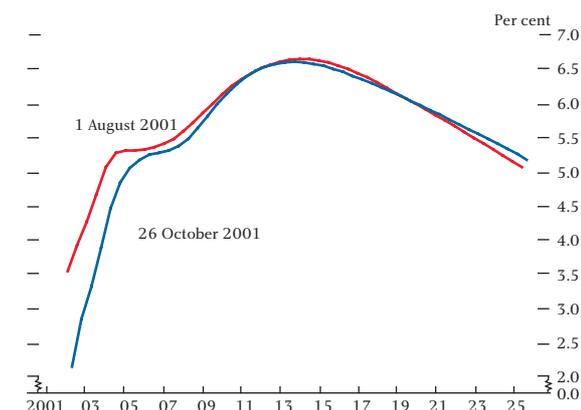
Chart 8
Three-month forward gilt yields^(a)



(a) Derived using the Bank's VRP curve-fitting technique. For further details see Anderson, N and Sleath, J, 'New estimates of the UK real and nominal yield curves', *Bank of England Quarterly Bulletin*, November 1999.

(1) The implied standard deviation is a measure of the width of the probability distribution of expected future interest rates at the time of expiry of the option contracts.

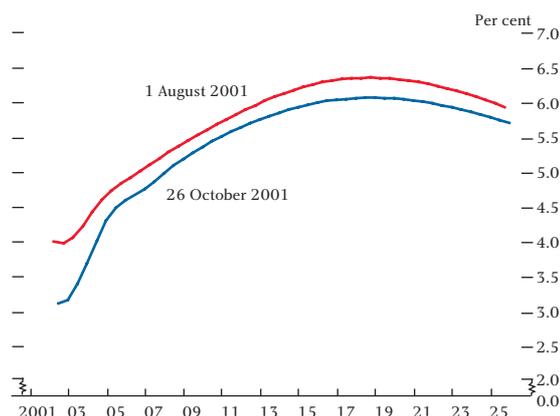
Chart 9
Three-month forward US Treasury yields^(a)



(a) Derived using the Bank's VRP curve-fitting technique.

and 9). Forward rates derived from the Bund yield curve declined at all maturity horizons but near-term rate expectations fell by more than long-dated forward rates (see Chart 10).

Chart 10
Three-month forward Bund yields^(a)

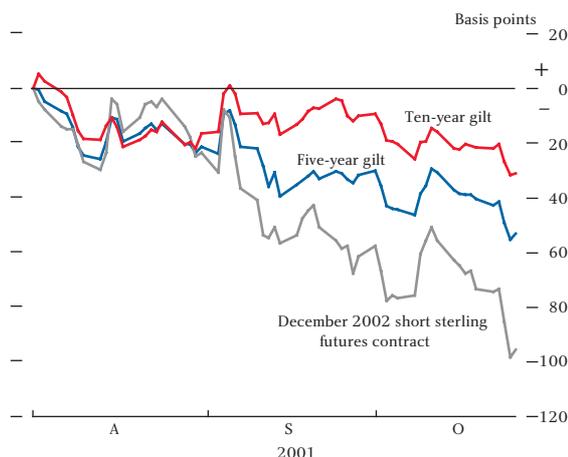


(a) Derived using the Bank's VRP curve-fitting technique.

The fact that short and medium-term forward rates declined while more distant forward rates were little changed suggests that the dominant influences on the US and European government bond markets were downward revisions to market participants' forecasts for growth and inflation over the next few years. Consequently, the profile of yield changes for government bonds with maturity dates out to about ten years was similar to that of short-term interest rate futures (Chart 11 illustrates this for the sterling markets).

In August and the first half of September, correlations between the daily percentage changes in equity price indices and the daily changes in bond yields for maturities out to ten years were positive and above the

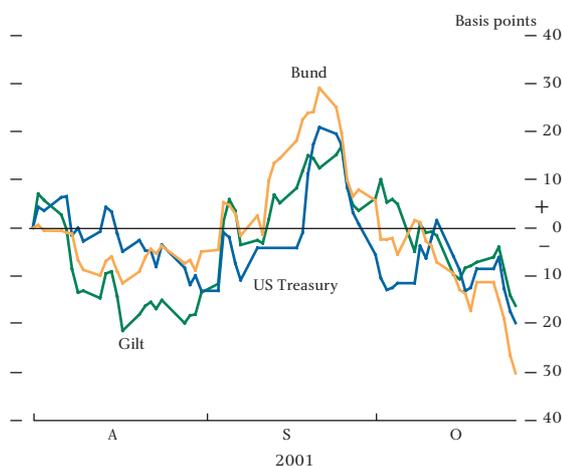
Chart 11
Cumulative changes in sterling interest rates since 1 August



average levels of the previous two years, with government bond prices tending to rise when equity prices fell. Two possible explanations (not necessarily mutually exclusive) may help to explain this. First, falling equity prices could have been associated with portfolio shifts (eg by pension funds) out of equities and into bonds. Second, both short-term interest rate expectations and equity prices may have been influenced by shifting perceptions about the economic outlook.

Although longer-dated US and European government bond yields ended the period only 20–30 basis points lower than their 1 August levels, they moved in a wide range within the period. Chart 12 illustrates that the daily profile of changes in long-dated gilt yields was similar to that of long-dated US Treasury and German Bund yields. This suggests that all three markets were mainly influenced by the same factors.

Chart 12
Cumulative changes in 20-year government bond yields since 1 August^(a)



(a) Derived using the Bank's VRP curve-fitting technique.

The most pronounced change in long bond yields during the period was the rise and fall that occurred in September and October. It is difficult, however, to explain these movements fully. One of the reasons for the rise in long bond yields that was widely discussed by market participants was changes to forecasts of government budget positions. Market participants' forecasts for the US and UK government budget surpluses over the next two years were revised down between July and October and forecasts for the German government's budget deficit were increased (see Table C).

Table C
Forecasts for government budget positions^(a)

	US (\$ billions)		Germany (€ billions)		UK (£ billions)	
	2000/01	2001/02	2001	2002	2001/02	2002/03
9 July	210	219	-36.6	-28.2	6.7	1.3
15 Aug.	185	194	-39.0	-31.5	5.6	0.4
10 Sept.	170	168	-39.7	-31.5	4.3	0.3
8 Oct.	144	17	-42.7	-38.9	3.9	-3.3

Source: Consensus Economics.

(a) Survey means.

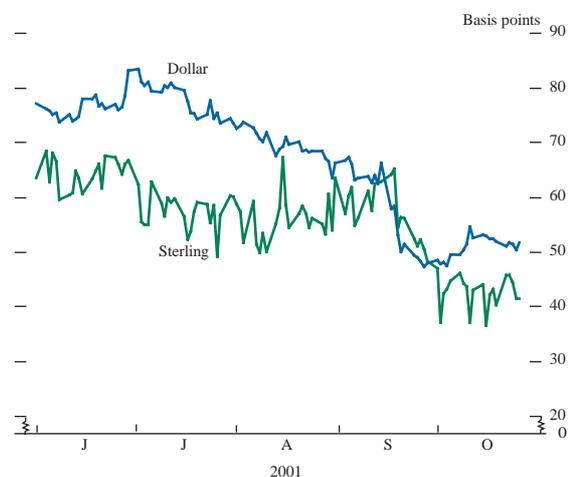
The associated rise in market participants' forecasts of future government bond issuance principally reflected the expected impact of lower economic growth on tax receipts and social security expenditures. In the US case, these developments were likely to have been augmented by the administration's proposals for tax cuts and a widely held belief that the government's response to the 11 September terrorist attacks would involve increased military expenditures. Long-dated US government bond yields increased notably following the Treasury's announcement on 17 September that it was suspending its debt buyback operations until October; in the recent past, these operations have been largely targeted on long-maturity bonds.

A general rise in uncertainty and a desire to reduce risk after 11 September may have also contributed to the increase in long bond yields. As noted above, immediately following the terrorist attacks there was said to have been increased demand for the most liquid and lowest-risk assets, principally short-dated government paper, and a reduction in the demand for other types of financial assets. This may temporarily have added to the upward pressure on long gilt yields around this time.

Whereas the supply of government bonds is limited, there is no limit to the available supply of swap contracts that market participants can buy or sell. Furthermore,

the fixed component of an interest rate swap contract is generally considered to contain only a relatively small credit risk premium.⁽¹⁾ Consequently, movements in the spreads between interest rate swaps and government bond yields may provide some indication of the impact of changes in market forecasts about future government bond issuance—the spread might be expected to narrow when increased issuance of government bonds is anticipated. Immediately after the terrorist attacks, short-dated swap spreads widened, reflecting a general flight by market participants to the most liquid short-dated government securities. This widening was only temporary, however; by the end of the period, swap spreads at short and medium maturities were slightly narrower than on 1 August. In contrast, there was less evidence of a flight to long-dated government bonds immediately after 11 September. Rather, prospective increases in future issuance dominated this segment of government bond markets; 30-year dollar and sterling interest rate swap spreads declined by around 10–20 basis points in mid-September (see Chart 13). This development is broadly similar to the narrowing in US swap spreads that occurred in the month after the Iraqi invasion of Kuwait, on 2 August 1990.

Chart 13
Thirty-year swap spreads



Source: Bloomberg.

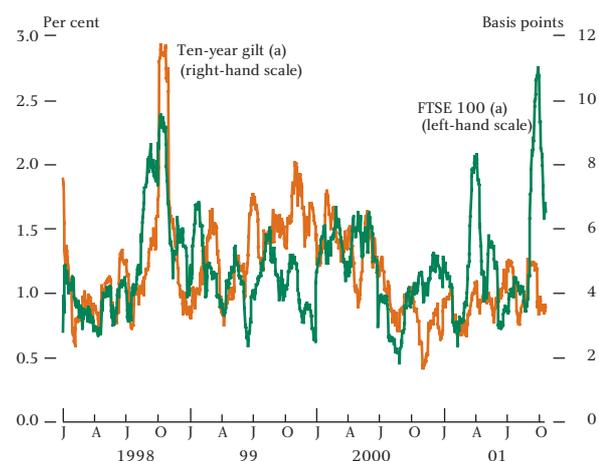
The fall back in long bond yields in late September and October is not readily explained by any further changes to forecasts of fiscal positions. The decline in long-maturity yields was common to most fixed-income instruments and swap spreads were little changed.

One potential explanation for the decline in long bond yields in the second half of the period is that risk

(1) The floating-rate leg of an interest rate swap settles against a six-month Libor or euribor rate; the banks that make up the Libor contributor panel exclude lower-rated banks.

aversion may have returned to more normal levels. This would have helped to reduce any risk premia required on longer-maturity bonds and swaps relative to short-dated, liquid bonds. The volatility of financial markets is commonly used by market participants as an indicator of uncertainty. As can be seen from Chart 14, equity market volatility picked up markedly in the period immediately following 11 September and then fell back again in October. In contrast, government bond market volatility was much less affected.

Chart 14
FTSE and gilt market volatility



(a) Twenty-day moving standard deviations of the daily changes in ten-year spot gilt yields and the daily percentage changes in the FTSE 100 index.

Another influence on long bond yields in the second half of the period may have been the fact that new issuance of non-government bonds was very low in the month after 11 September. Given that most non-government bonds are held to maturity by institutional investors and are not actively traded, much of the demand for long bonds is often met from new issuance. Consequently, the lack of new supply may have contributed to the fall in long bond yields in the second half of the review period for both government and non-government securities.

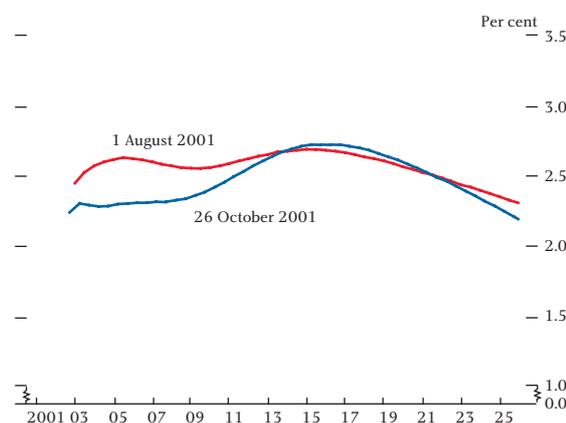
In addition to the above considerations, there were a number of factors specific to the United Kingdom that may have reinforced the previously mentioned movements in long-dated gilt yields. In mid-August, a report released by Bacon & Woodrow estimated that 17 of the FTSE 100 firms' defined benefit pension schemes were under-funded relative to their Minimum Funding Requirement (MFR) targets. This report may have contributed to an expectation of increased demand for long-dated gilts from pension funds, thereby generating downward pressure on long gilt yields in August. Then, on 18 September, the government released its proposals for reforming the MFR, including,

as an interim measure, extending the deficit correction periods over which seriously under-funded pension schemes have to reach 90% and 100% of their MFR funding targets. This reduced the immediate pressure on some pension funds to sell equities and buy gilts, thereby adding to the upward pressure on gilt yields.

Similarly, on 24 September the Financial Services Authority announced a temporary relaxation of the resilience test applied to life insurance companies. This may have also lessened the need for such firms to sell equities and buy bonds as equity prices fell. However, by the time this measure had been announced, long gilt yields had already started to fall back. It is not clear, therefore, whether this development had a significant impact on gilt yields.

Movements in index-linked gilt yields broadly tracked the changes in conventional gilts during the period. Short-dated real yields fell by 50–75 basis points between 1 August and 26 October, while long-dated real yields were little changed in net terms. Reflecting these developments, implied expected inflation rates derived from conventional and index-linked gilts declined over the review period. The largest reductions in implied forward inflation rates occurred over the nearer-term horizons (see Chart 15). The index-linked gilt market is not as liquid as the conventional gilt market; movements in real yields often, therefore, reflect changes in the available supply of index-linked gilts, at least in the short term. Nevertheless, it appears that the dominant influences on index-linked gilts during August, September and October were downward revisions to growth forecasts. Similarly, in the United States, implied expected ten-year inflation rates declined over the period as a whole.

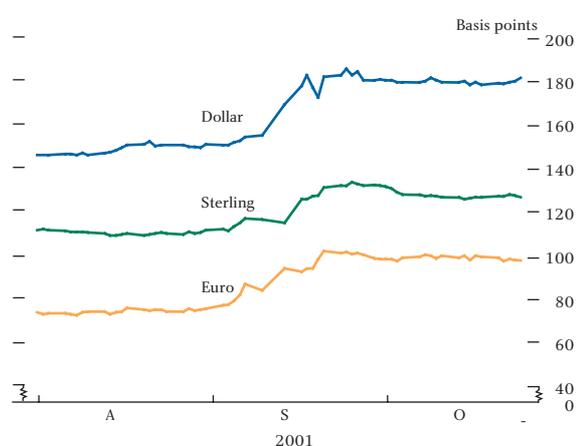
Chart 15
Implied forward inflation rates derived from gilts^(a)



(a) Derived using the Bank's VRP curve-fitting technique.

The worsening outlook for world economic growth and corporate earnings generated increased concerns about credit risk and an associated rise in the spreads between the yields of non-government and government bonds (see Chart 16). A decomposition of the sterling corporate bond spreads by industry reveals that all sectors were affected, albeit to differing degrees. Firms in the basic industry, telecommunications, technology and electronics sectors experienced the largest increases in credit spreads, followed by industrials, while the credit spreads of financial firms increased only moderately.

Chart 16
Corporate bond spreads^(a)



Source: Merrill Lynch.

(a) Spreads between Merrill Lynch's master non-government bond yield indices and government bond yields. The Merrill Lynch indices include non-government bonds from all sectors, ratings and maturities.

Japanese government bond yields were largely unchanged between August and October. This probably reflected the fact that (unlike the United States and Europe) there were only limited revisions to forecasts of future Japanese government bond issuance.

Equity markets

Major international equity indices fell over the period (see Table D), to levels still further below their 2000 peaks (see Chart 17). Equity prices fell substantially in August and early September (see Table E), as data releases pointed to a greater-than-expected slowing in the world economy. The major equity indices fell further after the terrorist attacks of 11 September. Perceptions of uncertainty rose and the risk premium may have increased. Implied volatilities from options prices jumped up (see Chart 18), while the skewness of the probability distribution of expected future equity prices implied by option prices became more negative. But, by late October, equity prices had risen back to levels similar to those before the terrorist attacks (see Table E).

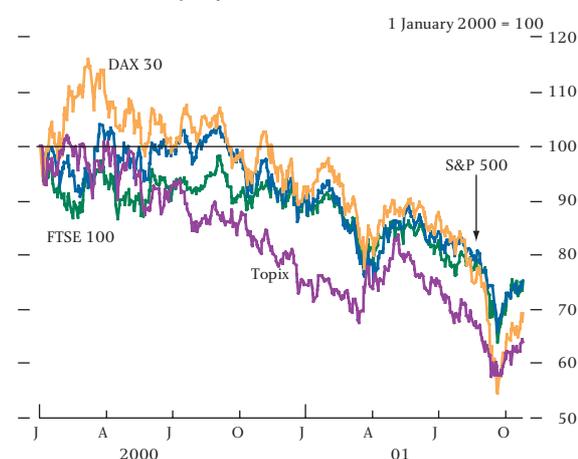
Table D
International equity market performance

Percentage changes between start and end of period in local currencies

	2000 Year	2001 Q1	1 Apr. to 31 July	1 Aug. to 26 Oct.
United States				
S&P 500	-10.1	-12.1	5.7	-9.2
Wilshire 5000	-11.9	-12.6	6.9	-9.5
Europe				
Euro Stoxx	-5.9	-11.2	-2.4	-12.5
CAC 40	-0.5	-12.6	-2.4	-12.4
DAX 30	-7.5	-9.4	1.7	-17.4
FTSE All-Share	-8.0	-9.1	-1.6	-7.2
FTSE 100	-10.2	-9.5	-1.6	-6.5
Japan				
Topix	-25.5	-0.5	-6.2	-8.8
Technology				
Nasdaq Composite	-39.3	-25.5	13.7	-14.5
FTSE techMARK 100	-32.2	-24.8	-17.5	-11.2
Neuer Markt	-40.1	-38.9	-19.6	-16.2

Source: Bloomberg.

Chart 17
International equity indices^(a)



(a) In local currencies.

Table E
Equity index movements before and after the terrorist attacks

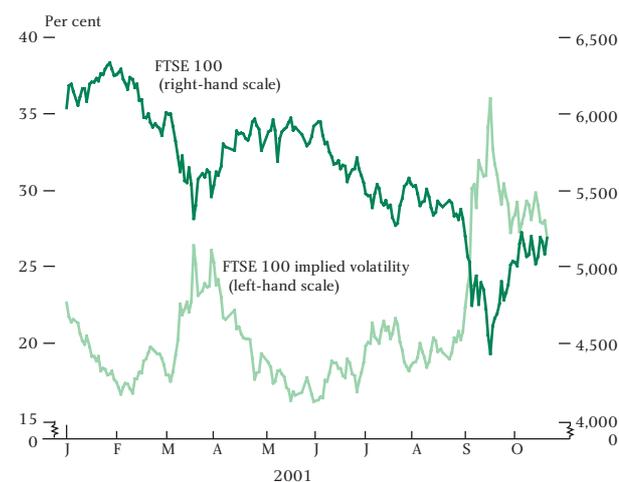
Percentage changes between start and end of period in local currencies

	1 Aug.–10 Sept.	10 Sept.–21 Sept.	21 Sept.–26 Oct.
United States			
S&P 500	-10.1	-11.6	14.4
Wilshire 5000	-10.3	-11.9	14.4
Europe			
Euro Stoxx	-14.6	-17.3	23.9
CAC 40	-14.3	-16.7	22.6
DAX 30	-20.0	-18.9	27.3
FTSE All-Share	-8.8	-12.7	16.6
FTSE 100	-9.3	-11.9	17.0
Japan			
Topix	-12.5	-5.5	10.3
Technology			
Nasdaq Composite	-18.0	-16.1	24.3
FTSE techMARK 100	-15.9	-20.6	32.9
Neuer Markt	-27.9	-22.9	50.7

Source: Bloomberg.

The recovery may have reflected a reversal in uncertainty (as indicated by Chart 18). The worst fears of market participants immediately after the attacks about the

Chart 18
FTSE 100 level and three-month implied volatility^(a)



(a) Derived from options on FTSE 100 futures.

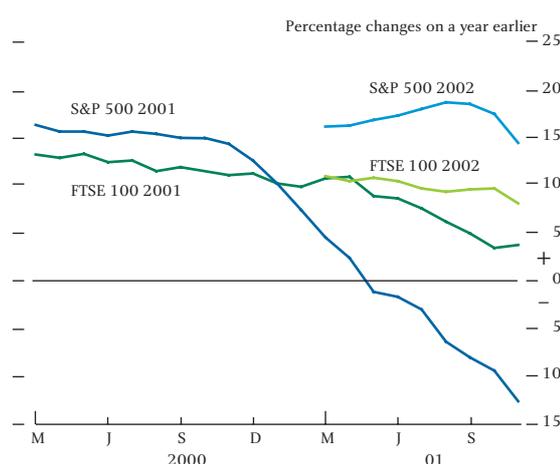
impact on consumer and business confidence were generally not realised, in the short term at least, and there was considerable monetary policy easing by central banks which may itself have boosted confidence. However, several sectors were affected in a fairly direct way by the terrorist attacks and fell particularly sharply between 10 September and 26 October; for example in the United Kingdom share prices in the insurance sector fell by 9.3% and in the leisure, entertainment and hotels sector by 9.7%.

Over the period as a whole, the falls in equity indices seem to have reflected both reductions in corporate earnings expectations and increased uncertainty about future equity prices and the general macroeconomic outlook (see the box on the decomposition of equity price movements on page 378). Lower short-term interest rates will have been an offsetting influence.

Analysts' expectations of growth in earnings per share⁽¹⁾ for the S&P 500 and FTSE 100 in 2001 and 2002 fell between the surveys conducted during August and October (see Chart 19).⁽²⁾ 'Longer-term' earnings expectations, over a three to five-year horizon, also fell for the S&P 500—from 15.1% in September to 14.6% in November. In contrast, for the FTSE 100, they rose from 10.8% to 11.6% over the same period, suggesting that market views on long-term profitability may have helped to support UK equity prices in September and October.

A further indication of lower earnings expectations came from profit warnings. In Q3 there were 129 profit

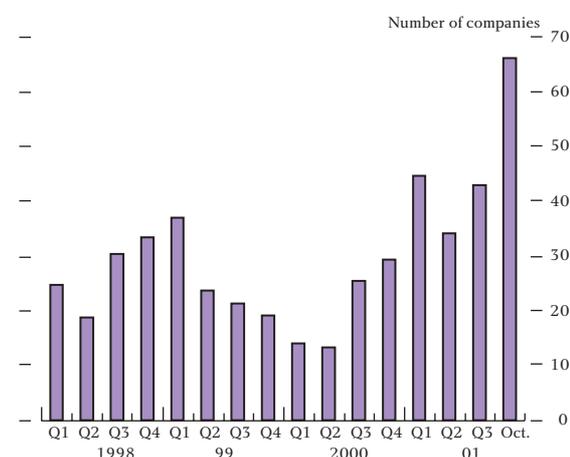
Chart 19
Earnings per share growth forecasts



Source: IBES.

warnings by UK firms, compared with 102 in Q2. Once again, IT companies accounted for more than a quarter of these warnings (more than would have been expected given the sector's 12% weighting in the FTSE All-Share index by number of firms). Reflecting this, the IT sector share price fell by 16% between 1 August and 26 October. Profit warnings were particularly high in October (see Chart 20). The terrorist attacks have so far been mentioned as an explanatory factor by 29 firms.

Chart 20
Profit warnings by UK firms^(a)



Source: Reuters.

(a) Monthly average number of UK firms listed on the FTSE All-Share index issuing a profit warning or negative trading statement.

Uncertainty about the macroeconomic environment, and in particular about future equity prices, appears to have increased between August and October, leading to an increase in the equity risk premium, and putting downward pressure on equity prices. Options data

(1) As measured by IBES (Institutional Brokers Estimate System).

(2) The dating convention for IBES is that the stated figure for a particular month is the result of a survey conducted towards the end of the previous month.

Decomposing equity price movements

Using the standard discounted cash flow dividend discount model (DDM)⁽¹⁾ approach to valuing equities, a fall in equity prices could reflect:

- lower current dividend payments;
- a fall in expected dividend growth;
- higher risk-free interest rates; or
- a higher equity risk premium.

In the case of constant dividend growth, g , and interest rates, r , the DDM equity price formula is:

$$P_t = \frac{D_t(1+g)}{(ERP+r)-g}$$

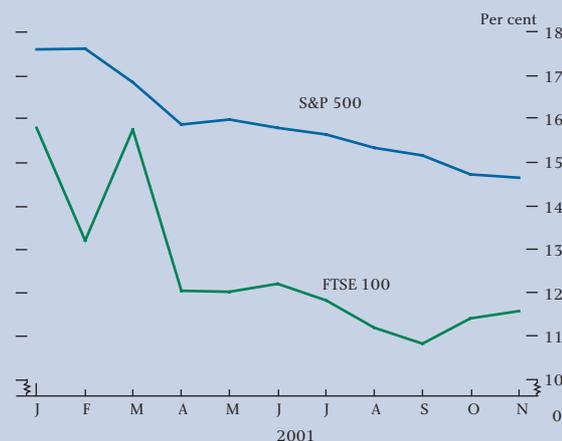
where D_t is the current level of dividends, and ERP the equity risk premium.

The current level of dividends is known, and government debt markets can be used to derive estimates of risk-free interest rates. The expected growth rate of dividends and the equity risk premium are not observable. However, it is possible to use market information as a guide to whether these two variables have changed over time.

There are direct market measures of uncertainty. As noted on page 379, there is a close short-term relationship between volatilities of future share prices, implied by options contracts, and the levels of the associated indices. Corporate bond spreads may also be informative in this respect. Both suggest that there may have been a rise in the equity risk premium since August, though the sharp rises in volatilities following the 11 September terrorist attacks were quite short-lived.

The market's view of the likely future growth of dividends will depend on current company profits—to the extent that these are retained and re-invested—and on the overall outlook for productivity and corporate earnings. GDP growth forecasts and profit warnings provide some indication of prospects. Another source of information on dividend growth is the monthly IBES survey of analysts' expectations for earnings per share for the FTSE 100 and S&P 500 indices. The main text notes the recent falls in the earnings per share forecasts for 2001 and 2002. There have also been falls in the 'long-term' forecasts, for a three to five-year horizon, since the start of 2001 (see Chart A).

Chart A
IBES long-term growth forecasts for earnings per share during 2001



Source: IBES.

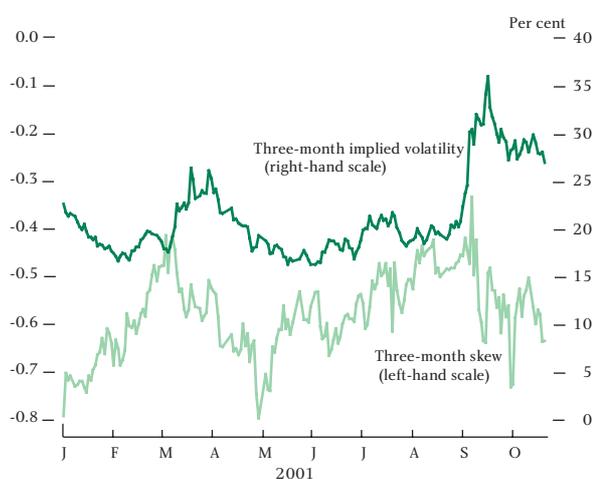
Using these forecasts, together with figures on current earnings and retention ratios,⁽²⁾ suggests that changes in these forecasts help to account for some—but not all—of the falls in the S&P 500 and FTSE 100 since mid-2000. The calculations indicate that there have also been increases in equity risk premia, consistent with rises in other indicators of uncertainty.

(1) See for example, Grinblatt, M and Titman, S (1998), 'Financial markets and corporate strategy' (McGraw Hill), pages 375–76, and the box on equity market valuations in the *Bank of England Financial Stability Review*, June 2001, pages 36–37.

(2) It is assumed that, beyond the IBES horizon, earnings growth gradually adjusts down to a long-run rate tied down by the condition that the rate of return on capital equals the cost of equity.

suggest that the market became more uncertain about the outlook for equity prices, and increased the probability attached to further falls in equities. In the United Kingdom, the skew for the FTSE 100 was more negative at 26 October than at 1 August (although it was less negative than earlier in the year). Implied volatilities rose to unusually high levels (see Chart 21). Together with the more negative skew this implies that the likelihood of further falls in the index was thought by market participants to be much higher than at the start of August, or that risk aversion was greater. For the S&P 500, the movements in volatilities and skews were similar to the FTSE 100.

Chart 21
FTSE 100 skewness and implied volatility^(a)



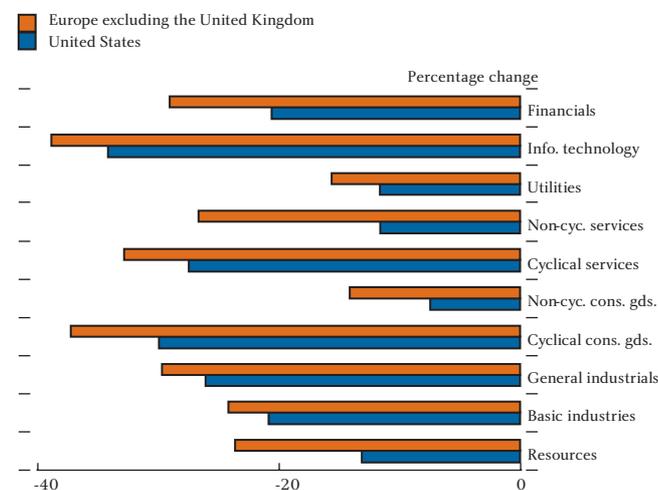
(a) Derived from options on FTSE 100 futures.

The increases in implied volatilities from options contracts appear to have been only partly related to the terrorist attacks—they had already been rising before 11 September. Although the sharp rise following the attacks was later mostly reversed, implied volatilities remained higher than in the summer. There has been a clear short-term inverse relationship between implied volatilities and the levels of equity indices over the past few years (see Chart 18).

Correlations among most major international equity indices increased between Q2 and Q3, reflecting the perception that the economic slowdown and the impact of the terrorist attacks were global phenomena. US, UK and euro-area equity markets moved broadly in line. Prices in the euro area fell by most over the period, reflecting relatively large falls to the 21 September trough (see Chart 17, and Chart 1.4 in the November *Inflation Report*). The German DAX index fell particularly sharply, much of this in the period prior to 11 September (see Table E). The falls in the euro area

were greater across all sectors (see Chart 22), with different sectoral composition explaining little of the relatively larger falls in the aggregate indices.

Chart 22
Changes in Datastream sectoral equity indices^(a) between 1 August and 21 September 2001

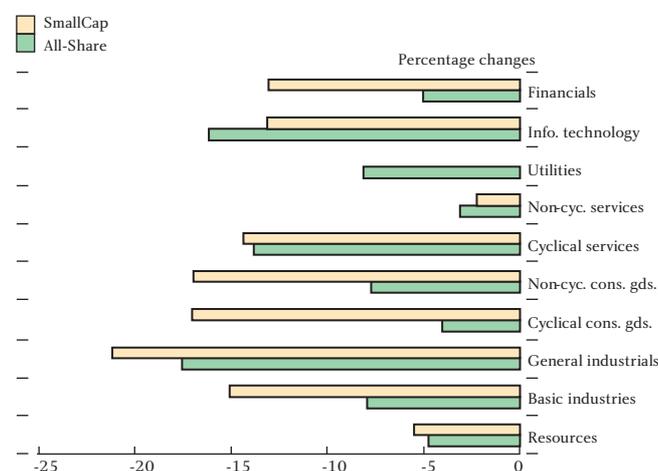


Source: Thomson Financial Datastream.

(a) In local currencies.

There have also been large differences between the various indices within the United Kingdom. In particular, as noted in the November *Inflation Report*, there were unusually large divergences between the FTSE 100, FTSE 250 and FTSE SmallCap indices in the weeks immediately following the terrorist attacks (see the November *Report*, Chart 1.7). Bank analysis suggests that around half of the gap that opened up between the FTSE SmallCap and FTSE 100 reflected the different sectoral weights of the indices, while such weighting differences can explain most of the gap between the FTSE 100 and the FTSE 250. The FTSE 250

Chart 23
Changes in FTSE sectoral equity indices between 1 August and 26 October 2001



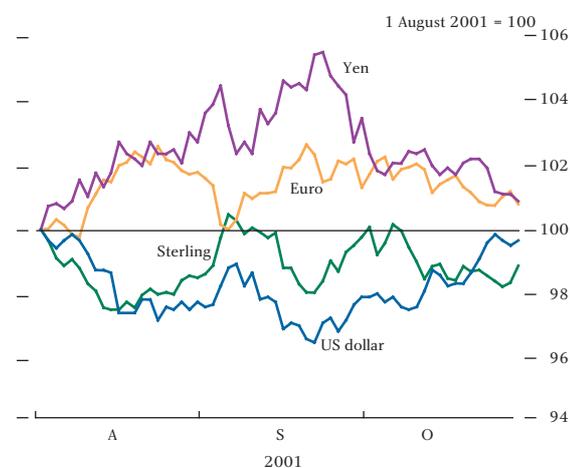
Source: Thomson Financial Datastream.

and FTSE SmallCap indices have high weights for the IT and cyclical services sectors, which are among those that have fallen by most since August (see Chart 23).

Foreign exchange markets

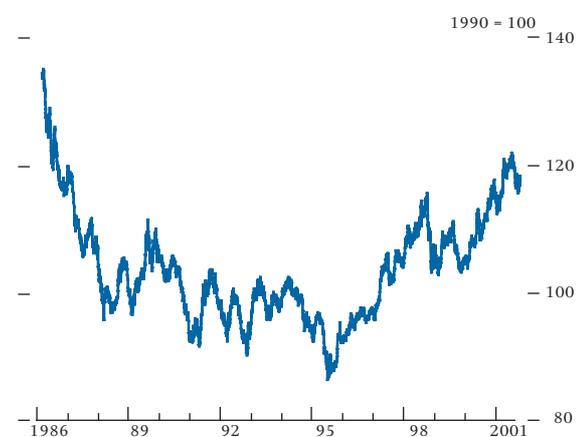
Among the major currencies, exchange rate movements were relatively small over the period as a whole (see Chart 24). Between 1 August and 26 October, the dollar trade-weighted exchange rate index (ERI) depreciated by 0.3%, while the euro and yen ERIs appreciated by 0.8% and 0.9% respectively. The sterling ERI fell by 1.1%.

Chart 24
Effective exchange rate indices



The depreciation of the US dollar between 1 August and 26 October, while limited, reflected falls of 1.5% against the euro, 1.3% against the yen and 0.1% against sterling, although it rose by 2.5% against the Canadian

Chart 25
US dollar effective exchange rate index



dollar. At the end of the period the dollar ERI was only 2% below its 15-year high recorded on 5 July this year (see Chart 25).

The dollar's depreciation against the euro, yen and sterling over the period appeared to be related to changes in interest rate differentials and growth expectations. Official interest rates and short and medium-term market interest rates declined by more in the United States than in other industrial countries during the period. Furthermore, changes during the period in growth forecasts for 2001 and 2002 showed larger falls for the United States than for the United Kingdom, the euro area and Japan, according to Consensus Economics. However, most of the changes in interest rates and growth expectations occurred after 11 September, and yet most of the dollar's depreciation occurred in August.

Market participants explained the dollar's fall in August by reference to the relatively weaker economic outlook for the United States, and increased concerns over the sustainability of the United States' current account deficit. Before the attacks, economic data for the United States had, on balance, showed the economy continuing to weaken. The dollar's sharpest fall came after the 8 August release of the Federal Reserve's *Beige Book*. The dollar also fell sharply following the release in mid-August of the IMF's Article IV Report on the United States. Comments made by IMF Board members published with the Report led to renewed concerns among market participants about the possibility of a sharp and sustained dollar depreciation, and about potential difficulties in financing the US current account deficit (for example if overseas investors reduced their appetite for US assets). Over the period as a whole there was little change in the measures of equity and bond capital flows produced by investment banks, although on balance there was some limited evidence of diminishing demand for dollar-denominated assets.

In the immediate aftermath of the 11 September attacks, the dollar weakened further on concerns about the impact on the US economy. The Swiss franc appreciated sharply in mid-September against both the dollar and the euro, reflecting its traditional safe-haven status in times of uncertainty. The price of gold, another frequently mentioned safe-haven asset, also rose sharply. However, these movements were largely reversed by the end of the period, and the dollar on balance appreciated slightly between 11 September and 26 October. In general, other major exchange rates were relatively little changed over this period. Market participants have commented that the main characteristic of the foreign exchange market since the terrorist attacks has been risk

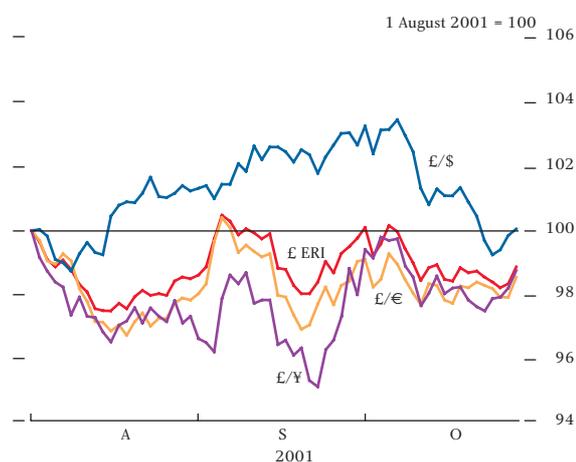
reduction, perhaps in response to the increase in global uncertainty, with risk-averse trading strategies and limited new position-taking.

Foreign exchange market participants initially viewed the impact of the attacks as more of a US-specific shock, but subsequently concluded that the economic downturn globally would be worse than previously thought. Such a view would be consistent with the large falls in short-term interest rates and equity markets around the world in the two weeks following 11 September, and the downward revisions in near-term growth forecasts. Nonetheless, many market participants considered that the longer-term growth prospects remained better for the United States than elsewhere, and such a view may have contributed to the appreciation of the dollar toward the end of the period.

The Japanese yen appreciated in the aftermath of the attacks on the United States. Market anecdote suggested that speculative players were looking to reduce risk by closing short yen positions (so-called 'yen carry trades'). Another explanation put forward by market commentators was that Japanese life assurance companies were reducing their holdings of US equities. The Bank of Japan intervened in the second half of September to limit the appreciation of the yen, principally buying dollars and selling yen; the total size of this intervention was reported to have been ¥3.2 trillion.

The sterling effective exchange rate index fell by 1.1% between 1 August and 26 October; sterling depreciated by 1.4% and 1.2% against the euro and yen respectively, and rose by 0.1% against the dollar (see Chart 26).

Chart 26
Sterling bilateral exchange rates



Sterling's movements were consistent with changes in short-term interest rates. UK short-term interest rates fell by less during the period than those in the United States, but by more than those in the euro area and Japan. At longer maturities interest rates in the United Kingdom fell by less than in the euro area. Growth forecasts for the United Kingdom for 2001 and 2002 were revised down by less than for other countries, consistent with sterling's appreciation against the dollar, but not with its depreciation against the euro and yen.

Between 1 August and 26 October, movements in sterling bilateral exchange rates appeared largely to reflect developments outside the United Kingdom. Sterling's depreciation against the euro was broadly consistent with the appreciation of the euro-dollar exchange rate, given the normal correlation between the two rates. During the previous period, and in particular around the time of the UK general election on 7 June, sterling's largest intra-day movements had been linked to speculation that the United Kingdom might apply for full EMU membership earlier than the foreign exchange market had previously expected. In the period after 1 August, there was less such speculation. Although sterling did depreciate against the euro and the dollar following the references to the euro made by the Prime Minister in his speech to the Labour Party conference on 2 October, these moves were largely reversed the following day.

Looking ahead, in response to political events and military actions following the terrorist attacks, some market commentators expect the dollar to appreciate, because of its safe-haven status, while others expect it to fall, because of the United States' role in the conflict. Despite these opposing views, and possibly since the events of 11 September were viewed as more of a global shock, the implied volatility of one-month euro-dollar option contracts fell over the period (see Chart 27), suggesting that uncertainty about future short-term movements in the euro-dollar exchange rate had diminished. Skew statistics derived from euro-dollar option contracts became more strongly euro-positive up to the middle of September, but then fell in the second half of the month (although remaining slightly euro-positive).

Over the period as a whole, implied volatilities for sterling from one-month to twelve-month maturities (as derived from sterling-euro and sterling-dollar option

Market functioning in the wake of the 11 September terrorist attacks

This box describes trading conditions in interest rate and foreign exchange markets in the week following the terrorist attacks in the United States on 11 September. It also provides details of liquidity provision by G7 central banks during that period.

Trading conditions

Activity in wholesale financial markets by market participants located in New York was greatly reduced for several days after the terrorist attacks. Dealing in many US dollar debt products continued in other centres but generally on a 'best efforts' basis only and for extended settlement. Some banks' operations in Europe were disrupted, for example by precautionary evacuations of their premises; and market participants reported that their clients were concerned during this period about settlement and liquidity issues in respect of dollar products. Prices were adjusted in response to the events but, with volumes very low, accurate price discovery was not possible in many markets. In the market for European government bonds most market-makers did continue to make two-way quotes, but at wider-than-normal spreads, particularly for non-benchmark issues. European government bond and interest rate futures contracts saw higher-than-normal volumes as a result. European equity markets continued to trade as normal, although trading of US equities listed on non-US exchanges was suspended in many cases.

In the London foreign exchange market, participants acted to limit trading as far as possible and to direct it towards risk reduction and essential customer order execution. Hedge funds and model-based players were said to be absent from the market for several days. Market participants mostly traded on an 'at best' basis; a few continued to quote two-way prices at wide spreads. With no appetite for position-taking, foreign exchange rates were stable after the initial reaction to the attacks, reacting little to data or other news until late in the week of the attacks. By contrast, implied volatilities increased markedly, although with options markets also very thin and spreads wide the moves may have been exaggerated. To a greater extent than in debt markets, trading continued to be for standard settlement dates.

In accordance with the advice of the US Bond Market Association, US-based bond market participants resumed trading on 13 September; normal trading hours were re-established on 20 September, and standard settlement resumed on 24 September.

Futures trading on the Chicago Mercantile Exchange and the Chicago Board of Trade also resumed on 13 September. US equity markets re-opened on Monday 17 September.

Once trading resumed in the United States, volumes and liquidity tended to improve day by day across markets. However, bid-offer spreads in debt markets remained higher than normal for several days, particularly for off-the-run issues. Repo markets took longest to return to normal: market functioning was impaired by a shortage of general collateral and failed trades associated with a large custodian. The dislocation in the US Treasury repo market was eased substantially by a special \$6 billion reopening of the on-the-run Treasury note on 2 October.

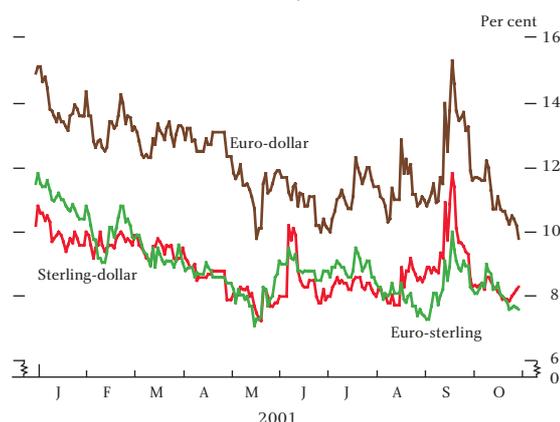
Central bank liquidity provision

On 12 September, G7 Central Bank Governors, in a joint statement with G7 Finance Ministers, indicated that they would 'provide liquidity to ensure that financial markets operate in an orderly fashion'. The Federal Reserve provided additional liquidity via its discount window—an average of \$11.7 billion per day was reported for the week ending 12 September—as well as through its standard overnight repo operations—an average of \$62 billion per day during the four working days from 12 September. Normal liquidity provision resumed on 19 September. The European Central Bank provided additional funds through snap tenders of €69 billion on 12 September and €40 billion on 13 September. In the immediate aftermath of the attacks, the Bank of Japan supplied an additional ¥2 trillion via normal open market operations. Short-term interbank cash rates in US dollars and euro were volatile for several days after the attacks. The Bank of England continued to provide the market's sterling liquidity needs with cash rates suggesting little evidence of pressures at this time.

Three central banks announced that they had agreed temporary swap facilities with the Federal Reserve under which their domestic currencies could be swapped for US dollars in order potentially to facilitate US dollar settlements in their domestic banking systems. These were the European Central Bank (\$50 billion), the Bank of England (\$30 billion), and the Bank of Canada (extending an existing facility from \$2 billion to \$10 billion). A number of other central banks announced that they would provide US dollar liquidity sourced from their foreign exchange reserves if necessary.

contracts) were broadly unchanged and remained below those for the euro-dollar exchange rate (see Chart 27), although volatility rose temporarily following the events of 11 September. Skew statistics derived from euro-sterling and sterling-dollar contracts appeared largely to reflect movements in the spot exchange rate and, latterly, the general risk aversion in the foreign exchange market; risk reversals were broadly neutral at the end of the period.

Chart 27
Exchange rate uncertainty^(a)



(a) One-month implied volatilities derived from foreign exchange option contracts.

The sterling money market

The amount outstanding in the sterling money market increased by £12 billion to £555 billion in Q3, having been broadly unchanged in the previous quarter (see Table F). Gilt repo saw the largest increase in amounts outstanding, with rises also recorded in certificates of deposit (CD) and interbank deposits. These increases were partly offset by a fall in stock lending.

Nominal amounts outstanding in gilt repo rose by about £16 billion, after having been broadly unchanged for more than a year. There was a strong increase at maturities of three months and longer, perhaps reflecting expectations prior to the events of

11 September that official rates were at or near their trough and would remain at that level for some time. Despite this increase in the size of gilt repo, which was large relative to the rise in the size of the interbank and CD markets, spreads between these instruments remained broadly unchanged.

While average daily turnover in gilt repo contracts rose slightly in the quarter to end-August (see Table G), anecdotal evidence suggests that activity in gilt repo and other money market instruments fell substantially in the days following 11 September. Initially, the repo market was affected by a decline in the availability of collateral. Bid-offer spreads widened and trading was said to be mainly limited to closing out short-dated positions, with participants having little appetite for taking on new risk. However, for short sterling futures, turnover remained strong for Q3 as a whole, and for September in particular, perhaps reflecting a flight to liquidity as market participants rapidly reassessed expectations for the path of future official interest rates.

Table G
Turnover of money market instruments

Average daily amount, £ billions

	1999	2000	2001		
			Q1	Q2	Q3
Short sterling futures (a)	54	45	60	66	71.5
Gilt repo (b)	13.6	17.8	15.7	17.9	18.2
Interbank (overnight)	8	10.4	10.5	11.1	9.3
CDs, bank bills and Treasury bills	n.a.	n.a.	11.8	12.4	11.4

n.a. = not available.

Sources: CrestCo, LIFFE, Wholesale Markets Brokers' Association and Bank of England.

(a) Sum of all 20 contracts extant, converted to equivalent nominal amount.
(b) Reporting dates are end-February for Q1, end-May for Q2, end-August for Q3, end-November for Q4 and end-year.

After 11 September, some insurance companies announced their intention to withdraw from equity stock lending activities. The Bank liaised bilaterally with market contacts on the implications of these developments, and also discussed the issue with market practitioners and others at the Stock Lending and Repo

Table F
Sterling money markets

Amounts outstanding: £ billions

		Interbank (a)	CDs (a)	Gilt repo (b)	Stock lending (b)	Eligible bills (a)	Commercial paper (a)	Other (c)	Total
2000	Q1	156	132	100	51	14	15	6	474
	Q2	159	135	124	54	12	16	7	507
	Q3	162	125	127	55	12	16	7	502
	Q4	151	130	128	62	11	18	9	509
2001	Q1	171	141	126	67	13	19	7	544
	Q2	177	131	128	67	12	22	6	543
	Q3	187	134	144	52	11	21	6	555

(a) Reporting dates are end-quarters.

(b) Reporting dates are end-February for Q1, end-May for Q2, end-August for Q3, end-November for Q4 and end-year.

(c) Including Treasury bills, sell/buy-backs and local authority bills.

Committee (SLRC), chaired by the Bank.⁽¹⁾ In the event only a few firms had withdrawn from the market and they were not major participants; a few press articles suggested that some believed short selling was exacerbating the declines in equity markets occurring in mid-September, and that as stock lending could be used to facilitate short selling, this was said to be a factor in their withdrawal from the market. These concerns were not, however, widely held, and the few withdrawals had no material impact on the overall market, including the fixed-income market.

Stock lending increases liquidity in cash markets by allowing intermediaries and others to take short positions, improves the price discovery process and allows for a more efficient hedging of derivatives and other instruments. This was recognised, for example, in the July 1999 Report of the International Organisation of Securities Commissions (IOSCO) and the Committee on Payment and Settlement Systems (CPSS) *Securities Lending Transactions: Market Development and Implications*. Also, a framework for the orderly conduct of stock lending and borrowing is provided by the Stock Borrowing and Lending Code, a revised code of market good practice produced by the SLRC in 2000.

The repo market in 'specials' continued to be dominated by those gilts that are deliverable into the long gilt futures contracts. While such gilts trade at a premium to general collateral (GC) repo, there have been a number of occasions recently when the premium was large enough to warrant a request by the market to open the Debt Management Office's standing repo facility.⁽²⁾

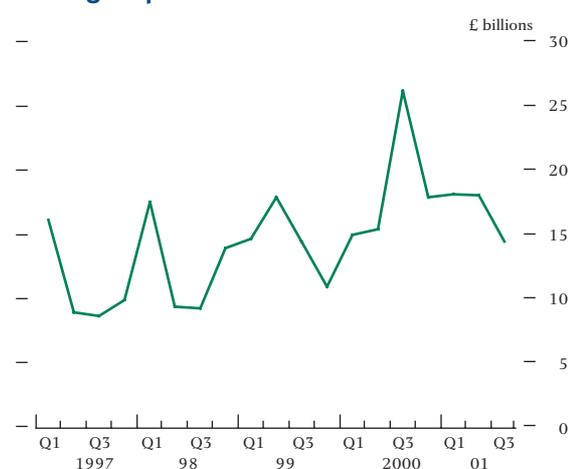
Sterling bond issues

The size of the gilt-edged market decreased by £2.8 billion in the third quarter to £283.4 billion, after increasing by £0.5 billion in the first half of 2001. About £7.7 billion of gilt-edged stock was redeemed, and the Debt Management Office (DMO) held two outright and one index-linked switch auction during the quarter (see Table H).

Issuance of non-government bonds denominated in sterling increased in July, but fell sharply in the following two months, leaving issuance for the third quarter as a whole sharply lower. About £15 billion was issued in the

sterling-denominated corporate bond market during Q3, down from nearly £18 billion in the previous quarter and a little over £26 billion in 2000 Q3 (see Chart 28). This fall was mainly accounted for by a reduction in fixed-rate issuance, which fell to £8.7 billion, sharply down from £13.3 billion in 2001 Q2. Floating-rate issuance held up better at £6.3 billion in Q3, which was more than the amount issued in Q2, but down from the amount issued in 2000 Q3. Also, there was no new issuance in the immediate aftermath of the terrorist attacks in the United States, and issuance remained low in the weeks that followed.

Chart 28
Sterling corporate bond issuance



Fixed-rate borrowing by AAA-rated issuers declined sharply, and this was the main component of the reduction in fixed-rate issuance during Q3; about £12.6 billion has been issued this year up to and including Q3, compared with £30.2 billion and £20.9 billion in 2000 and 1999 respectively. Beyond the possibility that the reduction in AAA-rated issuance reflected short-term fluctuations, it may have reflected a decline in AAA-rated corporate bond yields relative to gilt yields, leading some investors to consider the additional return from holding such bonds compared with gilts insufficient to warrant fresh purchases. With less institutional demand, issuance may have been deterred.

A reduction in corporate merger and acquisition activity may also have contributed to a decrease in borrowing by the private sector during the quarter, since the need to raise funds for cash-financed takeovers was diminished.

(1) See 'The Bank's contacts with the money, repo and stock lending markets', pages 431–33.

(2) For further details on this facility, see 'Response to DMO Consultation Document on 'Special' Gilt Repo Operations', UK Debt Management Office, February 2000.

Table H
Sterling bond issuance in 2001 Q3

DMO gilt auctions (£ millions)

Conventional	Date	Amount issued	Stock		
	26.09.01	2,500	5% Treasury Stock 2025		
Index-linked	Date	Amount issued	Stock		
	25.07.01	500	2% Index-linked Stock 2024		
Switch auction results	Date	Nominal switched	Source stock	Destination stock	Nominal created
	19.07.01	500	2% Index-linked Stock 2006	2½% Index-linked Stock 2016	561
Conversion offer results	Date	Nominal converted	Source stock	Destination stock	Nominal created
	23.07.01	4,958	9% Treasury Stock 2012	5% 2012	6,761

Corporate issuance

	Number of issues	Amount (£ billions)			
		Total (a)	By credit rating:		
			AAA	AA/A	BBB and lower
Fixed-rate issues					
UK corporates	12	3.3	0.5	0.8	2.0
UK financials	16	2.4	0.2	1.8	0.5
Supranationals	11	1.3	1.3	0.0	0.0
Overseas borrowers	11	1.6	0.7	1.0	0.0
Total (a)	50	8.6	2.7	3.6	2.5
Floating-rate notes					
UK corporates	4	0.7	0.4	0.2	0.2
UK financials	16	3.5	2.2	1.3	0.0
Supranationals	1	0.2	0.0	0.2	0.0
Overseas borrowers	22	1.9	0.5	1.3	0.0
Total (a)	43	6.3	3.1	3.0	0.2

Sources: Bank of England, Debt Management Office, Moody's, and Standard and Poor's.

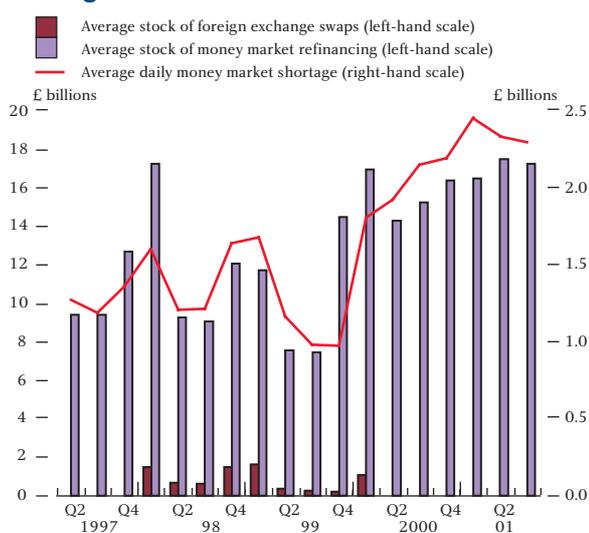
(a) Totals may not sum exactly due to rounding.

Open market operations

Between August and October, the stock of money market refinancing held on the Bank's balance sheet (which comprises the short-term assets acquired via the Bank's open market operations) averaged £17 billion (see Chart 29). This was broadly unchanged on the previous

three-month period, but some £2 billion higher than in the period August to October 2000, mainly reflecting the growth of the bank note circulation (which is the principal sterling liability on the Bank's balance sheet).

Chart 29
Stock of money market refinancing and daily shortages^(a)



(a) Calendar quarters.

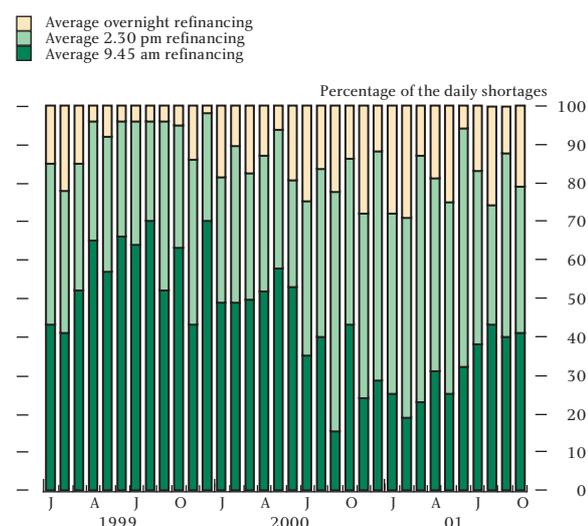
During the review period, daily money market shortages averaged £2.4 billion, compared with £2.3 billion over the period May to July 2001 (see Table I). This slight rise reflected a slightly increased rate of turnover in the stock of refinancing.⁽¹⁾ Over the review period, the Bank's counterparties refinanced 80% of the daily money market shortages at the 9.45 am and 2.30 pm rounds of operations (which broadly have a two-week maturity) and 20% at the late rounds, on an overnight basis (see Chart 30). In the previous three-month period, 16% of the refinancing had been undertaken on an overnight basis.

Table I
Average daily money market shortages

£ millions		
1996	Year	900
1998	Year	1,400
2000	Year	2,000
2001	Q1	2,500
	Q2	2,300
	July	2,200
	Aug.	2,600
	Sept.	2,100
	Oct.	2,500

(1) Although most of the Bank's open market operations are conducted via two-week reverse repo transactions, the average rate of turnover of the stock is usually around seven to eight working days. This is because the Bank's counterparties can choose to obtain refinancing by selling eligible bills with less than a two-week residual maturity on an outright basis, or can obtain overnight repo refinancing at a penal interest rate if they choose.

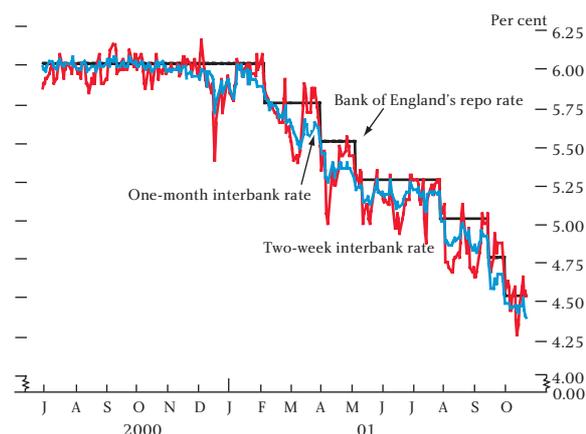
Chart 30
Refinancing provided in the Bank's open market operations



Some of the rise in counterparties' use of overnight refinancing (and consequent increase in the average size of the shortage) can be explained by the fact that there were strong market expectations that the MPC would cut interest rates at its meeting on 4 October. (On the two days prior to this decision the Bank's counterparties chose to take refinancing from the Bank largely on an overnight basis.) When counterparties expect the MPC to reduce the repo rate they may choose to take refinancing from the Bank largely on an overnight basis on the days immediately preceding the MPC meeting, even though this normally entails a short-term rise in their borrowing costs, as overnight refinancing from the Bank incurs a penal interest rate. This leads to a number of larger daily shortages as refinancing is rolled over from day to day. When counterparties choose to obtain a higher proportion of the refinancing on an overnight basis, the turnover of the stock of refinancing increases and, consequently, the average size of the shortages increases.

Chart 31 shows various short-dated money market interest rates and the Bank's repo rate. Counterparties made use of the deposit facility introduced on 27 June 2001 on two days between August and October, totalling £450 million. In order to leave the market square by close of business, on each occasion that the facility was used the Bank increased the amount of refinancing available at the 4.20 pm settlement bank late repo facility by the size of the deposit. The

Chart 31
Bank's repo rate and interbank rates



settlement banks then borrowed the full amount of this increased refinancing.

The deposit facility has continued to fulfil its objective of providing a 'floor' to the interbank overnight rate, and consequently other short-dated market interest rates. During the quarter, the lowest level at which the overnight rate traded in the market up to 3.30 pm (the time at which the Bank offers to take deposits from its counterparties) was 100 basis points below the Bank's repo rate. The Bank's lending operations at 3.30 pm, which are available to square off any remaining market imbalance on an overnight basis, seek to limit the highest level at which the overnight rate trades by providing liquidity at 100 basis points above the Bank's repo rate. The Bank continues to monitor closely the use and effectiveness of the deposit facility and recently discussed it with market practitioners at the Money Market Liaison Group meeting on 5 October.⁽¹⁾

Since the introduction of the deposit facility on 27 June 2001, the lowest level of the sterling overnight index average (SONIA) rate⁽²⁾ has been 85 basis points below the Bank's repo rate. By comparison, in the year before the introduction of the facility, SONIA was more than 85 basis points below the Bank's repo rate on 18 days.

In September, the Bank adjusted the amount by which it leaves the market short after the 9.45 am round of operations, even when the available refinancing had been fully bid for by counterparties. As reported in the 'Markets and operations' article in the Autumn 2001 *Quarterly Bulletin*, the previous adjustment had been made on 24 July when the amount had been reduced to

(1) See 'The Bank's contacts with the money, repo and stock lending markets', pages 431–33.

(2) The SONIA rate is a weighted average rate of brokered, unsecured overnight deals transacted between midnight and 3.30 pm (4.15 pm from 1 November 2001).

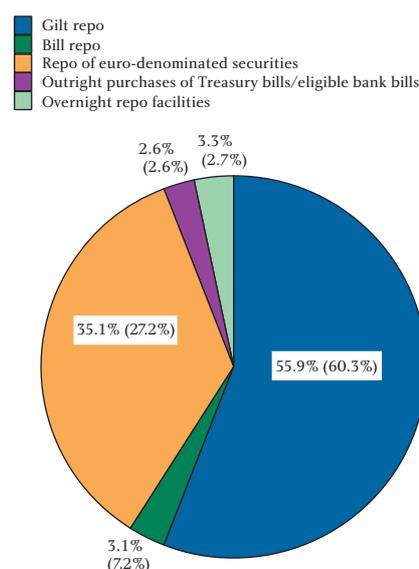
£600 million. In the wake of the terrorist attacks in the United States, the Bank sought to aid the transmission of liquidity to the sterling money market by reducing this amount to £200 million. However, there were insufficient bids from counterparties at the 9.45 am rounds of operations for this new level to fully take effect until 26 September, when £1,550 million was allotted at 9.45 am out of a total liquidity shortage of £1,750 million. This lack of demand for refinancing at the 9.45 am round was, in itself, an indication of the absence of strains in the sterling money market in the wake of the terrorist attacks.

Gilts accounted for around 56% of the stock of collateral taken by the Bank in its open market operations during August, September and October (see Chart 32). Euro-denominated eligible securities⁽¹⁾ (issued by EU governments and supranational bodies) accounted for around 35% of the collateral, up from a level of 27% in the three months to end-July.

HM Treasury and Bank of England euro issues

The Bank of England continued to hold regular monthly auctions during August, September and October of €1 billion of Bills, comprising €200 million of one-month, €500 million of three-month and €300 million of six-month Bank of England Bills. The stock of euro Bills outstanding was therefore maintained at €3.5 billion throughout the period. The auctions continued to be oversubscribed, with issues being covered an average of 4.99 times the amount on offer over the three-month period; Bills were allocated at average yields of between euribor minus 10 and 12.5 basis points for the relevant maturity.

Chart 32
OMOs—instrument overview^(a)



(a) This chart shows the average shares of the various instruments held by the Bank as collateral for open market operations from August to October 2001. Figures in brackets relate to May to July 2001.

The Bank reopened the Bank of England Euro Note maturing on 29 January 2004 with a final auction for €500 million on 16 October, raising the amount of this Note outstanding with the public to €2.0 billion. Cover at the auction was 9.43 times the amount on offer and accepted bids were in a range of 3.606%–3.624%.

UK gold auctions

The programme of gold auctions held by the UK government continued in the period under review. Twenty tonnes of gold were sold at the auction on 12 September; a price of \$280.00 per ounce was achieved and the auction was covered 4.3 times. The next auction will be held on 27 November 2001.

(1) A list of eligible securities is available on the Bank's web site at www.bankofengland.co.uk/markets/money/eligiblesecurities.htm