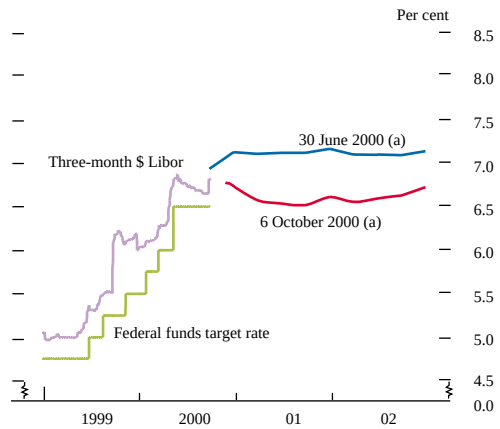
Markets and operations

This article reviews developments in international and domestic financial markets, drawing on discussions with the Bank of England's market contacts, and describes the Bank's market operations in the period 30 June to 6 October 2000.

- *Official interest rates were raised in the euro area by 50 basis points during the review period, and were left unchanged in the United States and United Kingdom.*
- *Short-term interest rate expectations for 2000–02 were largely unchanged in the euro area, but were revised down by around 30 to 60 basis points in the United States and the United Kingdom. An increasing number of market participants believed that official rates in the United States and the United Kingdom had peaked.*
- *The US and UK government bond yield curves became less inverted. The German government bond yield curve shifted upwards slightly during the period.*
- *Volatility in the money and bond markets diminished in Q3 and uncertainty about the short-term outlook for interest rates remained at historically low levels.*
- *World equity markets weakened during the period, but the volatility seen in stock prices in Q1 and Q2 diminished in Q3.*
- *The dollar appreciated further against all the other major currencies, while the euro continued to depreciate. On 22 September the G7 central banks intervened in the foreign exchange markets, buying euros.*

Chart 1
US interest rates



Source: Bloomberg.

(a) Interest rates implied by eurodollar futures contracts at the dates specified. From October 2000 onwards, the x-axis relates to contract expiry dates.

International markets

Short-term interest rates

In the United States, the Federal Open Market Committee (FOMC) left the Federal funds target rate unchanged at 6½% during the review period. There was also a significant fall in the market's short-term interest rate expectations (see Chart 1). Expectations were hardly changed after the 22 August FOMC meeting, reflecting the consensus view that rates would be left at 6½% (a Reuters poll taken before the meeting suggested that 28 of 29 economists anticipated such an outcome). In contrast, interest rates implied by short-term eurodollar futures contracts rose moderately after the 3 October meeting. Though the decision not to change the Federal funds target rate had been foreseen by most market participants, the FOMC's accompanying statement warning about the risks of heightened inflation pressures had been less fully discounted.

Table A shows that economic forecasters generally revised up their expectations for US economic growth during the review period. Average GDP forecasts for 2000 and 2001 reported by Consensus Economics increased by 0.4 and 0.5 percentage points, to 5.2% and 3.6% respectively. Nonetheless, short-term dollar interest rates fell

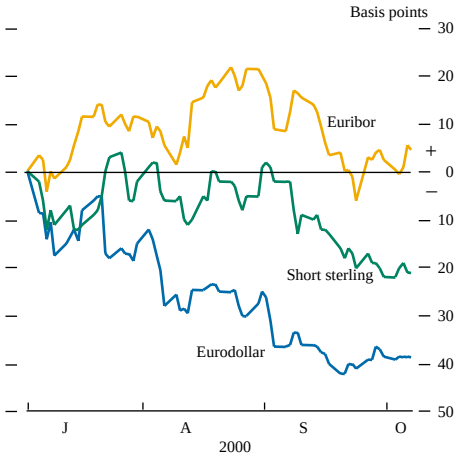
Table A
Forecasts for GDP growth

Per cent; *percentage points in italics*

	2000			2001		
	July	October	Change	July	October	Change
United States	4.8	5.2	*0.4*	3.1	3.6	*0.5*
Euro area	3.4	3.4	*0.0*	3.2	3.1	*-0.1*
United Kingdom	3.0	3.0	*0.0*	2.6	2.7	*0.1*
Japan	1.5	2.0	*0.5*	1.6	2.0	*0.4*

Source: Consensus Economics.

Chart 2
Cumulative changes in expectations for three-month interest rates(a)



Source: Bloomberg.

(a) As indicated by changes in rates implied by futures contracts maturing in December 2000.

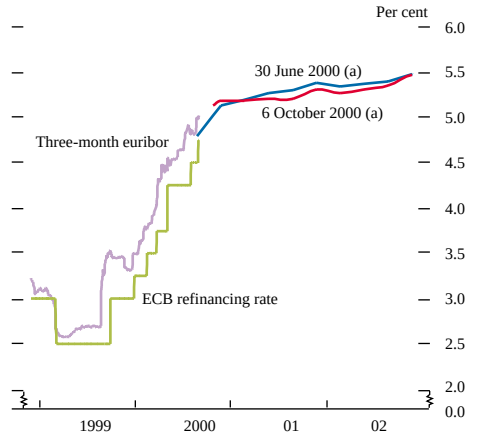
Table B
Forecasts for inflation

Per cent; *percentage points in italics*

	2000			2001		
	July	October	Change	July	October	Change
United States	3.2	3.3	*0.1*	2.6	2.7	*0.1*
Euro area	1.9	2.2	*0.3*	1.7	2.0	*0.3*
United Kingdom	2.0	2.1	*0.1*	2.4	2.3	*-0.1*
Japan	-0.4	-0.6	*-0.2*	0.0	-0.1	*-0.1*

Source: Consensus Economics.

Chart 3
Euro-area interest rates



Source: Bloomberg.

(a) Three-month interest rates implied by euribor futures contracts at the dates specified. From October 2000 onwards, the x-axis relates to contract expiry dates.

gradually throughout the period (see Chart 2). Rates implied by Federal funds futures fell by around 35–60 basis points for contracts expiring in 2000–02. Despite the significant fall over the period as a whole, daily changes in short-term interest rates tended to be moderate. For example, the standard deviation of daily price movements for the front futures contract was only 3 basis points in Q3, down from 5 basis points in Q2.

The main influences on short-term interest rate expectations over the period were weaker-than-expected price and labour market data. Inflation indicators were generally interpreted as benign, especially the prices component of the August Chicago Purchasing Managers' Index survey. The July and August provisional labour market reports recorded declines in non-farm payrolls, and the average hourly earnings component was also seen as benign. In addition, comments from Federal Reserve Chairman Greenspan to the Senate Banking Committee on 20 July also contributed to the fall in rate expectations.

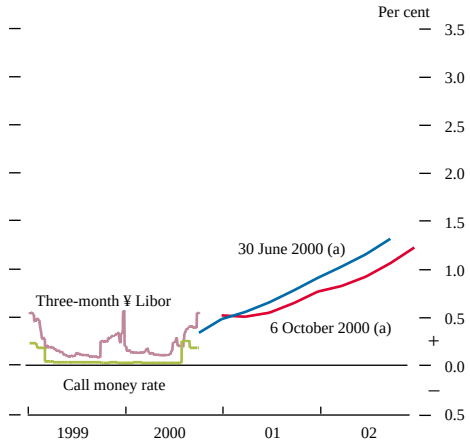
Reflecting the stronger-than-expected GDP growth and weaker-than-expected employment growth, US non-farm productivity increased at an annual rate of 5.3% in Q2, much higher than the median market expectation of 4.5%. Furthermore, this estimate was subsequently revised upwards on 6 September to 5.7%. This supported the belief of many market participants that growth could continue at a higher rate than previously thought without increasing inflation pressures. Consequently, market expectations of inflation were revised up only marginally during the period, despite the quite large upward revisions to growth (see Tables A and B).

The market also revised down its expectation for the peak in the FOMC's official rate. On 30 June, futures contracts settling on the Federal funds target rate suggested a peak of 6.96% in March 2001. By 6 October, the market's central expectation was that there would be no further increases in the target rate, and that there was some chance of a decline in the official rate in the first quarter of 2001.

The European Central Bank (ECB) raised its refinancing rate by 25 basis points on 31 August and by a further 25 basis points on 5 October, to 4.75%. Ahead of the August meeting, a minority of market participants had expected the ECB to raise its refinancing rate by 50 basis points, due to evidence of rising inflationary pressures and perceived price risks from higher oil prices and the depreciation of the euro. Consequently, rates implied by euribor futures contracts fell by 3–5 basis points after the ECB's announcement. Prior to the October decision there had been an expectation that the ECB would leave the refinancing rate unchanged—a Reuters poll, for example, reported that economists, on average, attached a 64% probability to such an outcome. Euribor rates therefore rose after the announcement.

Euro-area growth expectations were little changed during the period, while inflation expectations were revised upwards (see Tables A and B). Consistent with this, economists revised up their forecast for the peak in the ECB's refinancing rate—a Reuters poll on 5 October suggested an average forecast for the peak of 5.08%, compared with 4.94% in the survey conducted at the beginning of July.

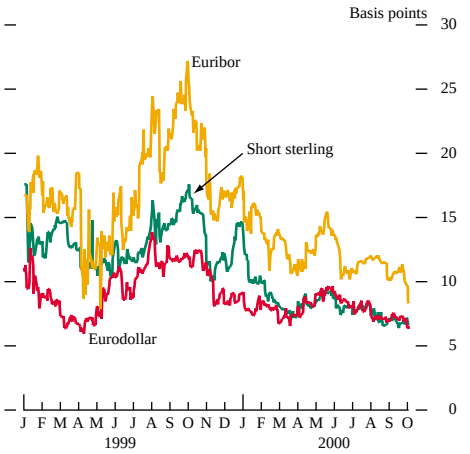
Chart 4
Japanese interest rates



Source: Bloomberg.

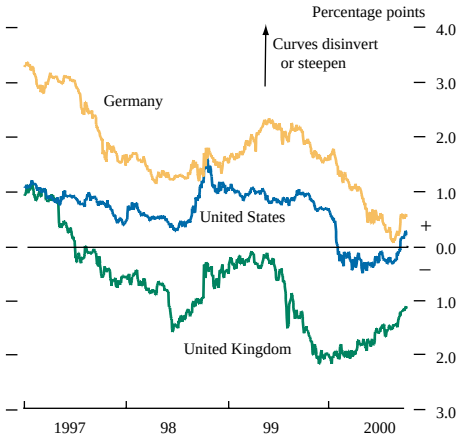
(a) Three-month interest rates implied by euroyen futures contracts at the dates specified. From October 2000 onwards, the x-axis relates to contract expiry dates.

Chart 5
Interest rate uncertainty(a)



(a) Implied volatility of three-month constant-horizon interest rate futures contracts.

Chart 6
Twenty-year minus two-year government bond yield spreads(a)



(a) Zero-coupon spot yields derived from the Bank's VRP curve-fitting technique. For further details on this technique, see Anderson and Sleath, *Bank of England Quarterly Bulletin*, November 1999.

In contrast, market interest rate expectations derived from euribor futures contracts were little changed over the period (see Chart 3). As in the United States, daily changes in short-term market interest rates were generally small; the standard deviation of daily price movements for the front euribor futures contract was only 3 basis points, compared with 5 basis points in Q2. Although international considerations influenced euribor rates on occasion, domestic factors appeared to be more important for much of the review period. The main influences that led to higher euribor rates included movements in the oil price and stronger-than-expected French and German CPI data (for June and September respectively), while the main influences that lowered euribor rates were German retail sales (for July), and the ECB rate announcement on 31 August. In addition, the depreciation of the euro also influenced rate expectations during the period; falls in the euro exchange rate index tended to coincide with increases in interest rate expectations relative to the United Kingdom and United States.

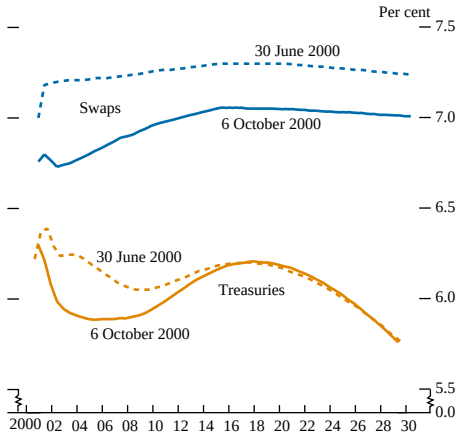
Short-term interest rate expectations implied by euroyen futures were virtually unchanged for the December 2000 contract, but fell by up to 25 basis points for contracts maturing in 2001–02 (see Chart 4). Interest rate expectations fell during July, partly reflecting weakness in the Japanese equity market (the TOPIX index, for example, fell by 9% in July). Rate expectations then rose in August both ahead of, and after, the Bank of Japan's decision on 11 August to raise the overnight call rate to 0.25%. The market had broadly expected this announcement, following comments from Bank of Japan officials and evidence of strengthening domestic activity. Rate expectations fell again in September, mainly for euroyen contracts with longer maturities, reflecting further weakness in the Japanese equity market, some weaker-than-expected activity data and downward revisions to inflation forecasts (see Table B).

There was little change in market uncertainty about the future path of interest rates in the United States and euro area (as measured by the prices of options contracts settling on euribor and eurodollar futures). Interest rate uncertainty remained at low levels, compared with the first quarter of this year and most of last year (see Chart 5).

Long-term interest rates

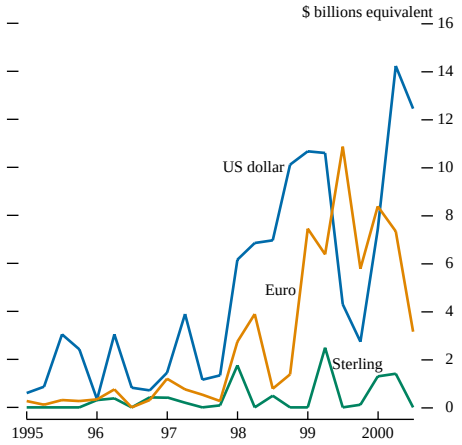
Yields on US Treasury securities with a maturity of five years or less fell by as much as 30 basis points during the period, while long yields were little changed. Consequently, the Treasury curve disinverted (see Charts 6 and 7). Movements in yields of all maturities were highly correlated during the first six weeks of the period, with the Treasury yield curve shifting down by 15–25 basis points. Thereafter, while short-maturity yields continued to fall, longer-maturity yields rose. The disinversion of the yield curve reflected a number of factors. First, higher oil prices led to an increase in inflation expectations and a rise in uncertainty about future inflation. As can be seen from Table B, the increase in inflation expectations for 2000 and 2001 was not particularly large, however. Second, comments by the United States presidential candidates led market participants to attach a higher probability to an easing of fiscal policy. These developments put upward pressure on yields at all maturities. Third, declines in equity prices at the end of the period led to increased flows into short-maturity government bonds. Consequently, short-dated yields fell relative

Chart 7
US Treasury and swap curves



Sources: Bank of England and Bloomberg.

Chart 8
Bond issuance by telecoms firms



Source: Capitaldata.

to longer-dated yields. The sharpness of the increase in longer-maturity bond yields in mid-September also caused some market participants to close out some of their long positions, thereby accentuating the yield movements.

Interest rate expectations can also be derived from the swap market. The swap curve shows the rates at which market participants are willing to exchange fixed-rate liabilities for floating-rate (Libor-based) liabilities. Over the review period, US swap rates fell at all maturities (see Chart 7), causing the spreads between swap rates and Treasury yields to narrow. The decline in short-dated swap rates was largely due to the same factors that affected short-term interest rate expectations. In addition, private sector dollar bond issuance was lower than expected and contributed to a fall in swap rates at all maturities—total non-government dollar-denominated fixed-rate issuance was $54 billion in Q3 compared with $63 billion in Q2. Market participants report that swap rates also fell because of higher-than-expected demand for fixed-rate income in the swap market from telecoms companies. Fixed-rate bond issuance by telecoms companies was about $12 billion in Q3, much the same as in Q2 (see Chart 8). Many of these telecoms firms issued fixed-rate dollar bonds to pay for licences for the Universal Mobile Telecommunications Systems (UMTS) in Europe. The market had anticipated such activity, but a greater-than-expected amount was then swapped into floating-rate liabilities in the dollar swap market (by receiving fixed-rate income and paying floating rate), then swapped into euros and sterling via currency swaps. This higher-than-expected demand to receive fixed-rate income from telecoms companies therefore contributed to the fall in dollar swap rates.

It is noteworthy that the US swap curve has remained positively sloped this year, even though the US Treasury curve has been inverted or, more recently, flat. In the United Kingdom, the gilt yield curve and the swap curve have been inverted for most of the period since the second half of 1997. The inversion of both government bond yield curves has been related to reductions in the outstanding stocks of government debt. In addition, in the United Kingdom, there has also been very strong demand for long-maturity sterling fixed-interest payments from institutions such as pension funds and life assurance companies. Such demand has also caused sterling swap rates to fall at longer maturities, by encouraging high-credit quality institutions (for example supranational institutions) to issue fixed-rate bonds to UK end-investors, and then receive fixed-rate income in the swap market.(1) This demand for fixed-rate income was not offset by a corresponding rise in the supply of fixed-rate income in the swap market, and caused a significant fall in longer-maturity sterling swap rates relative to short-maturity swap rates.

As noted previously, there has also been a rise in the demand to receive fixed-rate income in the dollar swap market. However, this has been a more recent phenomenon, with demand spread across a wider range of maturities than in the sterling swap market. Also

(1) These institutions are able to receive a higher rate in the swap market than the coupon rate payable on their bonds because of their higher credit rating. Hence they can lower their cost of financing by participating in both the sterling bond and swap markets (for further details see the box on page 130 of the May 2000 *Quarterly Bulletin*).

there is some evidence that liquidity is lower in the sterling swap market. Lack of liquidity may have exaggerated sterling swap rate movements resulting from the demand and supply imbalances noted above. A recent survey(1) suggested that turnover in the sterling swap market is more concentrated in the hands of a few market participants. The survey found that the highest market share of a firm in the sterling swap market was 73% for swaps with a maturity of ten years or more, compared with 16% in the dollar swap market (for maturities of less than ten years, concentration was only slightly higher in the United Kingdom). So there is some evidence that the inversion of the sterling swap curve not only reflects very strong demand for long-maturity fixed-rate income, but also perhaps a relative lack of liquidity, factors which have been less influential in the dollar swap market.

The German government bond yield curve shifted upwards slightly over the review period. Yields fell at longer maturities in the first six weeks of the quarter, partly reflecting upward revisions to the expected proceeds from the sale of UMTS licences and equivalent downward revisions to expected government bond issuance. The German UMTS auction finished on 17 August, raising €50.5 billion, five times the German government's initial forecast. It was confirmed that the proceeds would be used to reduce government debt. However, long-maturity yields rose over the rest of the period, reflecting concerns about rising oil prices and speculation that fiscal policies would be loosened following the petrol price protests in Europe. As in the United States, many market participants quickly reversed their trading positions as long-maturity yields rose, and this accentuated yield movements. German swap rates were little changed over the period.

Movements in Japanese government bond yields were similar to those of euroyen futures rates for much of the review period. Speculation that the Japanese government would announce a supplementary budget put some upward pressure on bond yields at medium and long maturities, causing the yield curve to steepen.

International equity market developments

Most of the major equity market indices fell over the review period, but price movements were generally much less volatile than earlier in the year. The S&P 500, Wilshire 5000, TOPIX, German DAX, and the French CAC were all weaker (see Table C), but the FTSE 100 finished 1.2% higher at 6391.

With the exception of Japan, global equity prices rose in July and August, partly reflecting the downward revisions to short-term interest rate expectations and the upward revisions to growth forecasts in the United States (see Table A). However, equity prices then declined sharply in September, due largely to three related considerations. First, market commentary increasingly focused on the dampening effect that higher oil prices might have on global activity, and the possibility that firms might be unable to pass on higher costs to their customers and so experience narrower margins. Second, more general concerns arose regarding the profitability of blue-chip companies, particularly in the United States where there were a number of announcements either of weaker-than-expected profits, or forecasting weaker future profits.

Table C
International equity market performance

Percentage changes from previous period, in local currencies

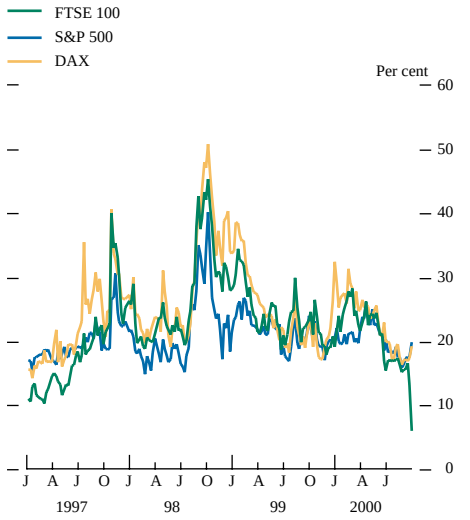
	1999	2000		
	Year	Q1	Q2	Q3 (a)
United States				
S&P 500	19.5	2.0	-2.9	-3.1
Wilshire 5000	22.1	3.5	-4.7	-3.5
Europe				
CAC 40	51.1	5.5	2.6	-2.9
DAX 30	39.1	9.2	-9.2	-1.8
FTSE All-Share	21.3	-4.1	-2.6	1.2
FTSE 100	17.8	-5.6	-3.5	1.2
Japan				
TOPIX	58.4	-0.9	-6.7	-5.6
IT indices				
Nasdaq Composite	85.6	12.4	-13.3	-15.3
FTSE techMARK 100	56.1 (b)	14.6	-21.7	10.0
Neuer Markt	66.2	95.0	-19.0	-16.5
Nouveau Marché	135.3	80.9	-30.5	11.6

Source: Bloomberg.

(a) 30 June–6 Oct. 2000.
(b) 4 Nov.–30 Dec. 1999.

(1) 'Swap volumes see euro wane', *Risk* magazine, September 2000.

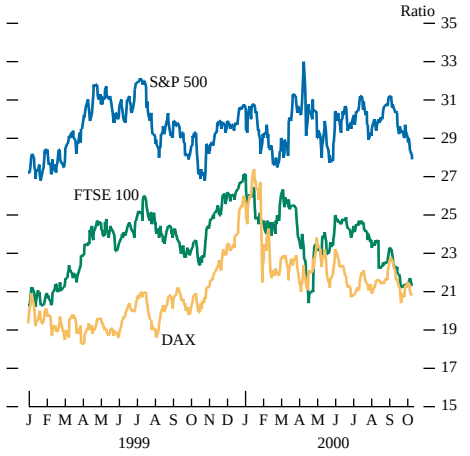
Chart 9
Implied volatility of major equity indices(a)



Source: Bloomberg.

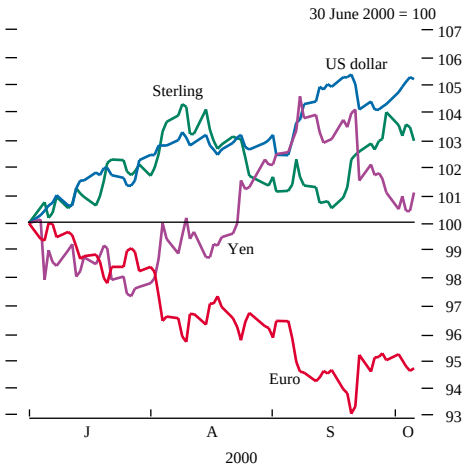
(a) Implied volatility of three-month constant-horizon equity options contracts (weekly average).

Chart 10
Price/earnings ratios for equity market indices



Source: Primark Datastream.

Chart 11
Effective exchange rate indices



Third, telecommunications and technology stocks fell sharply in September. These declines reflected weaker-than-expected profit announcements and concerns about the costs to telecom companies of European UMTS phone licences. In the United States, the 13% fall in the Nasdaq in September coincided with a 5% fall in the S&P 500 index. And in Germany, the worst-performing sectors of the DAX included telecoms, software and other technology stocks.

For the period as a whole, technology indices gave a mixed performance, unlike in the first half of this year, when the movements in these indices were more closely correlated. The Nasdaq and German Neuer Markt fell, while the FTSE techMARK and French Nouveau Marché both rose (see Table C). Equity prices for UK technology firms were lifted by better-than-anticipated results.

In Japan, the TOPIX fell through most of the period. First, the liquidation in July of Sogo (a large department store group) contributed to speculation that there might be further bankruptcies. Second, there were reports of Japanese companies reducing their holdings of Japanese equities ahead of the financial half-year-end in September. For example, a Merrill Lynch survey of Japanese fund managers showed a decline in the number with overweight positions in Japanese equities (from around 65% to 60%) and an accompanying decline in the number with underweight positions in US equities (from around 40% to 15%).

Volatility in all the major markets (except Japan) was on average lower during the review period than in Q2, though it rose at the end of the period. Furthermore, uncertainty about future price movements remained quite low. The implied volatility of the FTSE 100 index fell to levels last seen in 1997, before the financial market turbulence of that year (see Chart 9).

Despite announcements of weaker-than-expected profits, the falls in major equity market price indices led to lower price/earnings (P/E) ratios(1) (see Chart 10). The P/E ratio for the S&P 500 fell to 28 at the end of the period, down from a peak of 33 in the middle of 1999. The P/E ratio for the FTSE 100 was around 21 on 6 October, also close to its level at the start of 1999. Nevertheless, P/E ratios remain high by historical standards.

Foreign exchange markets

The main exchange rate developments over the period were the appreciation of the dollar, the renewed depreciation of the euro, and the concerted intervention by the central banks of the Group of Seven (G7) countries on 22 September. Between 30 June and 6 October, the dollar's trade-weighted exchange rate index (ERI) increased by 5.2% while the euro ERI fell by 5.3%. Both the sterling and yen exchange rate indices appreciated, rising by 3.0% and 1.1% respectively (see Chart 11).

Changes in short-term interest rates appeared not to influence exchange rates during the period. The appreciation of the dollar's effective exchange rate and bilateral rates against sterling, the euro and the yen occurred despite short-term interest rates falling by

(1) The price/earnings ratio relates a company's share price to its annual earnings.

more in the United States than in the United Kingdom, the euro area and Japan (see Chart 2). Similarly, the euro depreciated against the dollar, sterling and the yen, even though euro-area interest rates rose by more or fell by less than in the United States, United Kingdom and Japan. The Bank of Japan's decision to end its zero interest rate policy on 11 August had been widely anticipated by financial market participants and had little impact on the foreign exchange market.

Exchange rates were, therefore, primarily influenced by factors other than short-term interest rates over the period. Market commentary focused on changes in countries' relative growth prospects. Higher potential growth is often associated with increased equity market returns which, in turn, help to attract more foreign investment, thereby generating greater demand for the local currency in the foreign exchange markets. As the supply of government bonds has declined, equity flows have received increasing attention as a potential influence on exchange rates.

The dollar's appreciation in Q3 coincided with the release of stronger-than-expected data for Q2 GDP and labour productivity, together with continued indications of relatively benign inflation pressures. These data encouraged market participants to believe that the US economy would avoid a 'hard landing', involving higher inflation, higher interest rates and sharp declines in equity valuations and GDP.

Some market participants use recent GDP growth outturns and short-term forecasts to estimate changes in potential growth. In the United States, consensus forecasts for GDP growth in 2000 and 2001 were revised up over the period (see Table A). By contrast, most forecasts for GDP growth in the United Kingdom and euro area were little changed. Changes in short-term relative growth prospects were therefore consistent with the dollar's appreciation against sterling and the euro in Q3. Japanese Q2 GDP data, released in mid-September, exceeded market expectations and led most forecasters to revise up their projections for Japanese GDP growth in 2000 and 2001. This is consistent with the yen's appreciation against sterling and the euro.

Market sentiment more generally was also an influence on exchange rates. Sentiment towards the euro was negative in Q3, with market participants seemingly reacting more to negative than to positive news. For instance, there was little effect on the currency from potentially positive developments on structural reform, including the legislative passage of the German tax reform package, and larger-than-expected revenues from the German UMTS auction. Instead, market participants focused on evidence of slower euro-area growth. Another recurring theme was the outflows of foreign direct investment, equity and bond capital from the euro area, in particular to the United States.

On 22 September, the G7 countries intervened in the foreign exchange markets, buying euros. The G7 summarised its activities in the following statement: 'At the initiative of the European Central Bank, the monetary authorities of the United States, Japan, the United Kingdom, and Canada, joined with the European Central Bank on Friday 22nd September in co-ordinated intervention in exchange markets, because of the shared concern of Finance

Chart 12
Sterling exchange rates

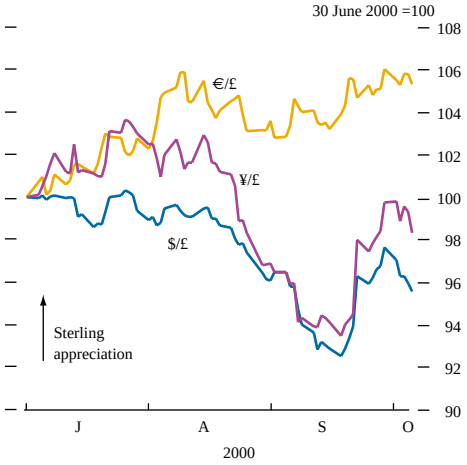


Chart 13
Sterling-dollar exchange rate

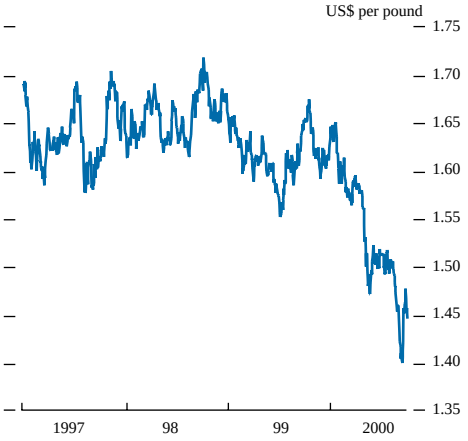
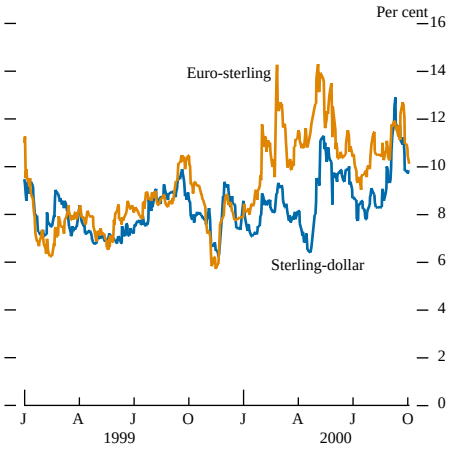


Chart 14
Implied volatility of sterling exchange rates(a)



Source: Chase Manhattan Bank.

(a) Implied volatility is derived from the one-month foreign exchange options prices.

Ministers and Governors about the potential implications of the recent movements in the euro for the world economy. In light of recent developments, we will continue to monitor developments closely and to co-operate in exchange markets as appropriate'.

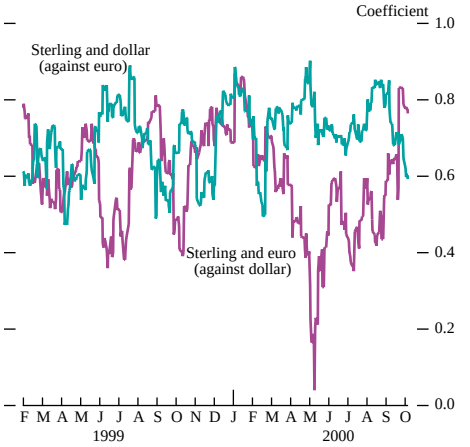
By the close of trading in London on the day of the intervention, the euro had appreciated by 3.4% against the dollar compared with its rate the previous evening. Following the intervention, euro call options (against the dollar) rose sharply in price relative to euro put options for maturities up to three months ahead, suggesting that market participants were willing to pay more to protect themselves against the risk of euro appreciation. By 6 October, the euro-dollar exchange rate had depreciated to below $0.87, from its high of $0.90 immediately after the intervention, but risk reversals at that point still indicated a preference for euro calls.

Sterling appreciated by 5.3% against the euro and depreciated by 4.7% against the dollar during the period. The appreciation against the euro occurred mainly in July and the second half of September, whereas the depreciation against the dollar took place during the second half of August and the first half of September (see Chart 12), suggesting that factors not specific to sterling were an important influence. On 12 September, sterling fell to a 14-year low against the dollar, slightly above $1.39. This coincided with a large mergers and acquisition related sale of sterling for dollars. The movement led to further market commentary about a possible 'decoupling' of the close relationship between sterling and the dollar. As Chart 13 shows, the sterling-dollar exchange rate had generally traded within the $1.60–$1.70 range over the period since the start of 1997. The sharp depreciation of sterling below this range since April has led to a rise in the implied volatilities of sterling-dollar options. Chart 14 shows that the implied volatility derived from sterling-dollar options contracts has generally been lower than for euro-sterling contracts. However, this situation was reversed briefly in mid-September, for the first time in nine months.

Another way to consider whether there has been a change in the relationship between sterling and the dollar is to examine the correlations of their co-movements against other currencies. Chart 15 shows exponentially weighted 20-day moving-average correlations between sterling and the dollar (against the euro), and between sterling and the euro (against the dollar). The correlation between movements of sterling and the dollar has been strongly positive, although it fell towards the end of the period. In contrast, movements in sterling and the euro have become more closely correlated since the end of April; furthermore, in mid-September the correlation became greater than that between sterling and the dollar.

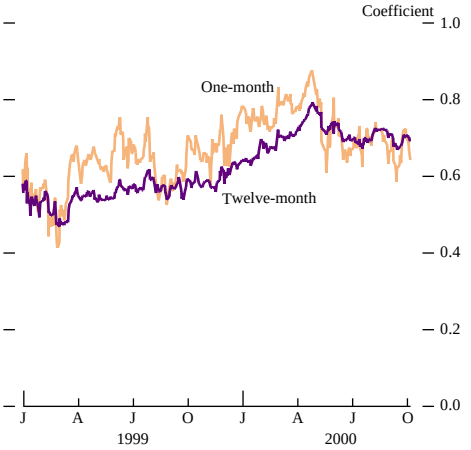
Charts 16 and 17 show the implied correlations between sterling and the dollar (against the euro) and between sterling and the euro (against the dollar). Unlike the moving-average correlations shown in Chart 15, which measure the past co-movement of spot exchange rates, these correlations are derived from options prices and measure the extent to which market participants expect currencies to move together one month and twelve months ahead. The relationship shown in Chart 16 has generally been strong and positive, implying that sterling and the dollar were expected to

Chart 15
Correlations between spot exchange rate pairs[a]



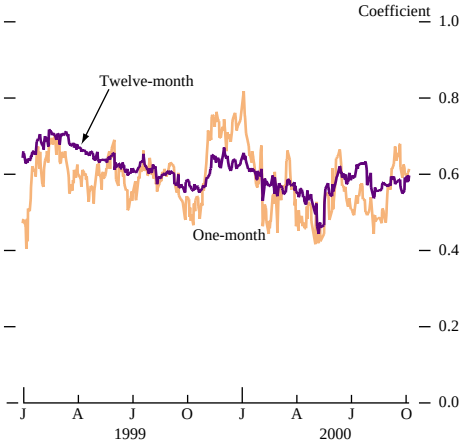
(a) 20-day exponentially weighted moving-average correlations, where daily movements are assigned geometrically declining weights.

Chart 16
Implied correlations between sterling and the dollar (against the euro)



Sources: Bank of England and Chase Manhattan.

Chart 17
Implied correlations between sterling and the euro (against the dollar)



move together against the euro. However, the one-month and twelve-month correlations have fallen since the end of April. Chart 17 shows that the degree to which markets expect sterling and the euro to move together has risen since the end of April. In mid-September, the one-month implied correlation between sterling and the euro exceeded that between sterling and the dollar for the first time since the start of the year. However, by the end of the period, the one-month implied correlation between sterling and the dollar was again higher than that between sterling and the euro. Furthermore, the twelve-month correlation between sterling and the dollar remained above that between sterling and the euro throughout Q3.

There is therefore some evidence that the closeness of sterling's relationship with the dollar has diminished. However, the correlation and implied correlation series are very erratic and it is not yet clear that there has been a structural break in the relationship. Moreover, implied correlations based on options prices suggest that future movements of sterling are still expected to be more closely aligned with the dollar than with the euro.

Sterling markets

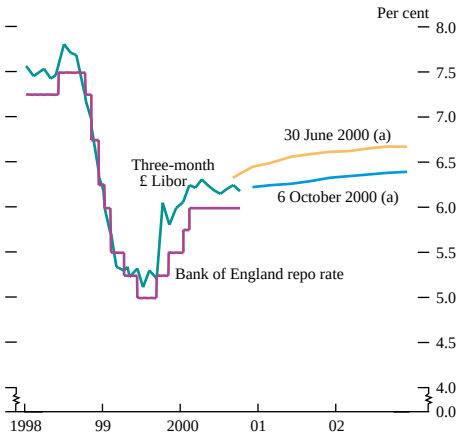
Short-term interest rates

Short-term interest rates were broadly stable during much of the review period, underpinned by the Bank of England's two-week repo rate, which remained constant at 6%. Forward rates implied by short sterling futures ended the period around 20 to 30 basis points below their start-point (see Chart 18), while forward rates derived from the gilt yield curve fell by up to 20 basis points. At the end of the period, neither measure reflected a strong expectation that the Monetary Policy Committee (MPC) would change the Bank's repo rate before the end of the year (see Table D). Expectations of interest rates in December 2000 derived from overnight interest rate swap markets remained at 6% throughout the period, and a Reuters poll of 30 City economists showed that the mean expectation for the level of the Bank's repo rate at the end of 2000 fell by 10 basis points to 6.14%.

During the period, the view that the official rate may have peaked became more widespread in the market. However, various measures of short-term interest rate expectations continued to imply slightly different profiles for the timing and level of the peak. By 6 October, the peak in short sterling futures contracts, which settle on three-month Libor, had fallen by around 30 basis points to 6.40%. Since Libor typically trades 20 to 25 basis points above the Bank's repo rate, this would be consistent with an expected peak in the official rate of around 6.15% to 6.20%. Expectations of the peak are likely to lie at the lower end of this range, however, because term premia tend to increase with the maturity of the futures contract, and the expected peak suggested by the futures market is not until late 2002. The peak derived from the gilt market for two-week forward rates fell by 13 basis points to 5.92%, which implies a Bank repo rate of a little over 6% after appropriate adjustments.(1) The mean forecast for the peak in the Bank's repo

(1) For further details, see the article on pages 392–402, which analyses the different ways of deriving short-term interest rate expectations from sterling money market instruments.

Chart 18
UK interest rates



Sources: Bank of England and Bloomberg.

(a) Three-month interest rates implied by the short sterling futures contracts on the dates specified. From October 2000, the x-axis relates to contract expiry dates.

Table D
Summary of interest rate expectations

Per cent

	5 Jan.	30 June	6 Oct.
Dec. 2000			
Short sterling (a)	7.13	6.19	5.98
Forward gilt yields (b)	6.82	6.16	5.93
Poll of economists (c)	6.32	6.24 (d)	6.14 (e)
Overnight interest rate swaps (f)	6.94	6.00	6.00
Peak			
Short sterling (a)	7.22 Dec. 2001	6.45 Dec. 2003	6.15 Dec. 2002
Forward gilt yields (b)	6.85 2001 Q1	6.20 2001 Q2	6.07 2001 Q2
Poll of economists (c)	6.52 2000 H2	6.34 2000 Q4	6.33 2000 Q3

Sources: Bloomberg, Reuters and Bank of England.

(a) Implied three-month Libor rate, adjusted for average difference between three-month Libor rate and Bank's repo rate.
(b) Implied two-week forward rates, adjusted for average difference between gilt repo rates and the Bank's repo rate.
(c) Mean expectation for Bank of England repo rate.
(d) Refers to survey on 29 June.
(e) Refers to survey on 28 September.
(f) Implied overnight interest rate.

rate indicated by the Reuters poll of City economists fell by just 1 basis point during the period, to 6.33%. At the end of the period, a minority of market participants thought that the next move in the official rate would be downwards.

Interest rates derived from short sterling futures contracts moved within a relatively narrow range in July and August, and then fell by around 20 basis points in September. Furthermore, the standard deviation of daily price changes in the front short sterling contract fell from 4 basis points in Q1 and Q2, to 3 basis points in Q3. The largest daily change in the front short sterling contract was 6 basis points, compared with 15 basis points in Q1 and 10 basis points in Q2. Uncertainty about the path of future interest rates implied by three-month options prices also continued to decline (see Chart 5). Before each of the four MPC policy decisions made during the period, most of the City economists polled by Reuters correctly predicted that the Bank's repo rate would remain unchanged.

In such quiet conditions, monetary and fiscal policy announcements altered short-term interest rate expectations as much as UK data announcements or international factors. The MPC's decisions to maintain the Bank's repo rate at 6% in August, September and October were each followed by small falls in market interest rate expectations, while each set of MPC minutes—particularly following the 5–4 votes in August and September—led to increased market expectations of a future rise in the Bank's repo rate. The most significant rise in market rate expectations occurred around the time that the Government's 2000 Spending Review was released, on 18 July. Short-term interest rate expectations rose by up to 15 basis points between 14 and 21 July, as market participants initially interpreted the Review's contents as implying an intention to loosen fiscal policy. This rise in short-term interest rate expectations was later reversed, however, after the MPC announced its no-change decision at the start of August, and following the publication of the August *Inflation Report*.

Two international factors had a significant effect on the sterling money markets during the period: the exchange rate and oil prices. Though the rise and subsequent fall in sterling's trade-weighted exchange rate index during July and August failed to change market interest rate expectations, sterling's appreciation in September was thought to reduce the probability that the MPC would raise the Bank's repo rate in the near future. This period of declining rate expectations was combined with a growing market consensus that higher oil prices were likely to dampen activity without putting significant upward pressure on inflation. The market therefore felt that the Bank's repo rate could be maintained at 6% without increasing the risk of inflation rising above the $2^1/_2$% target.

Domestic data releases during the review period were, on balance, weaker than market expectations. Three CBI surveys (two in July and one in September) had a significant downward impact on short sterling futures rates. Furthermore, the combination of several weaker-than-expected average earnings data releases and the slowdown in house price inflation contributed to a growing belief among market participants that the Bank's repo rate had peaked.

Table E
Sterling money markets[a]

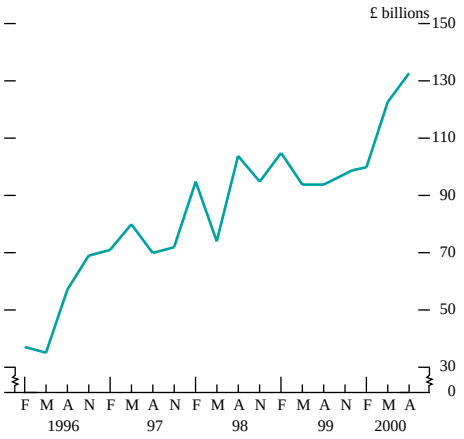
Amounts outstanding: £ billions

	Interbank	CDs	Gilt repo	Stock lending	Eligible bills	Commercial paper	Treasury bills	Sell/ buy-backs	LA bills (c)	**Total**
1990	89	53	n.a.	n.a.	23	5	9	n.a.	2	**181**
1995	93	66	n.a.	n.a.	20	6	8	n.a.	2	**195**
1998	150	122	95 (b)	35 (b)	19	10	1	2 (b)	1	**435**
1999	146	142	99 (b)	49 (b)	14	14	4	3 (b)	0	**471**
2000 Feb.	155	127	100	51	14	13	2	2	0	**464**
May	165	138	123	54	13	17	2	3	0	**515**
Aug.	160	133	133	53	12	15	3	5	0	**514**

n.a. = not available.

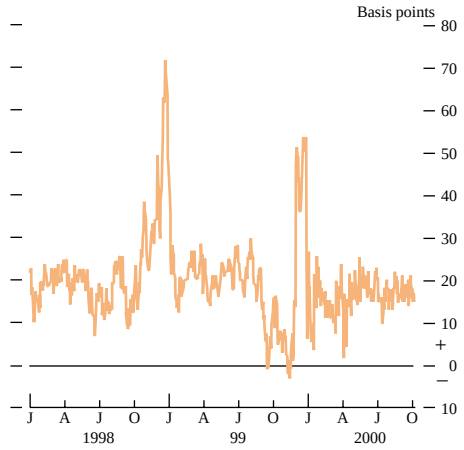
(a) 1990 and 1995 data are end-March; other data are end-period.
(b) End-November data.
(c) Local authority bills.

Chart 19
Gilt repo outstanding



Sources: Bank of England and Stock Lending Quarterly Survey.

Chart 20
Spread between one-month interbank and repo rates[a]



(a) Interbank offer rate minus GC repo (bid) rate.

The sterling money market

At the end of August, the size of the sterling money market was £514 billion, broadly unchanged from end-May.(1) Looking at the individual instruments, an increase in the outstanding stock of gilt repo was largely offset by falls in interbank deposits and certificates of deposit (see Table E).

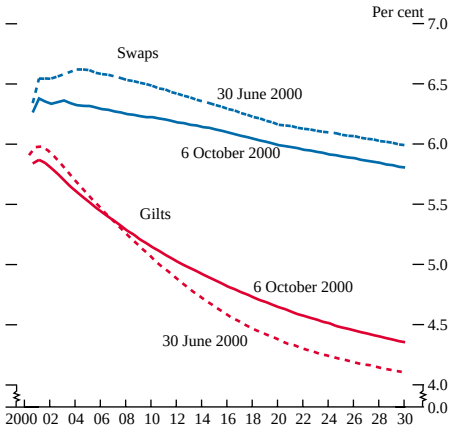
According to the Bank's latest quarterly survey, the amount of gilt repo outstanding rose by £10 billion in the three months to end-August, to £133 billion. This continued the strong growth recorded in the previous quarter (see Chart 19). Although the 'on call and next day' category retained the largest share of gilt repo outstanding, it was the '9 days to 1 month' and the '1 month to 3 month' maturity categories that increased the most. These changes are likely to have been partly influenced by the DMO's cash management operations, particularly its handling of the receipts from the Spectrum mobile telephone licence auctions (payments to the government were made in May and September). In addition, the gilt repo data may have been influenced by the slight increase in the Bank's average daily money market shortages over the quarter (implying a greater need for eligible collateral).

The gilt repo market has grown rapidly since its introduction in 1996. Although this has inevitably led to a decline in the relative shares of the other money market instruments, there has also been a sustained decline in the absolute level of eligible bank bills outstanding. Prior to 1997, eligible bank bills were the principal instrument used in the Bank's open market operations. By Q3 of this year, however, they accounted for only 6% of the collateral held by the Bank, whereas gilt repo transactions accounted for 72%. Although stock lending and repo have a complementary relationship,(2) the amount of stock lending has been little changed this year at just above £50 billion.

Spreads between secured (GC repo) and unsecured (interbank) interest rates for maturities out to one year remained broadly unchanged in Q3. Chart 20 illustrates recent movements in the one-month spread.

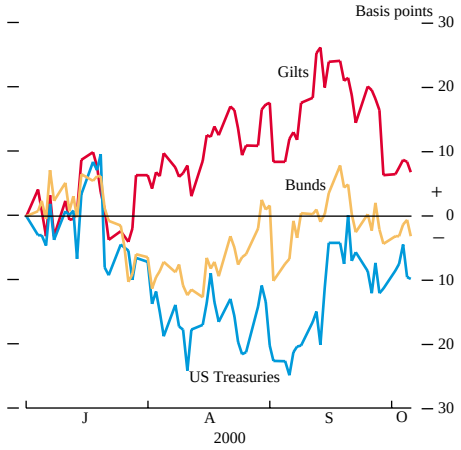
(1) The sterling money market for this purpose includes the interbank, certificate of deposit, gilt repo, stock lending, sell/buy-backs, Treasury bill, eligible bank bill, local authority bill and commercial paper markets.
(2) Many intermediaries borrow gilts from end-investors in a stock lending transaction and then lend them on to banks and securities houses through the repo market. End-investors often prefer not to repo out stock, since this would involve reinvesting the associated cash and requires close monitoring of the trade.

Chart 21
UK gilt and swap curves



Sources: Bank of England and Bloomberg.

Chart 22
Cumulative changes in ten-year government bond yields(a)



(a) Zero-coupon spot yields derived using the Bank's VRP curve-fitting technique.

Towards the end of September, member-to-member gilt repo transactions involving the 5¾% Treasury 2009 stock occasionally traded below 2% in the overnight market. This was unusually low relative to overnight GC gilt repo rates, which traded close to 6% at the time. This development largely reflected increased demand for the 2009 gilt as several short positions in the stock matured around that time. Although the stock was the cheapest to deliver into the maturing September long gilt futures contract, there were no reports of delivery problems into the LIFFE contract.

Long-term interest rates

Over the review period, the UK government bond yield curve became less inverted. Longer-maturity gilt yields rose and short-term yields fell (see Chart 21). In line with the money market developments noted above, daily changes in gilt yields at all maturities were generally small. The ten-year gilt yield, for example, traded within a 30 basis point range, down from 70 basis points in Q1 and 40 basis points in Q2. The swap yield curve also became slightly less inverted, although swap rates fell at all maturities. The spread of swap yields over gilt yields therefore fell.

As noted above, this movement in the gilt yield curve occurred alongside a disinversion of the US Treasury yield curve and a slight steepening of the upward sloping German government bond curve, suggesting that common international factors might have influenced all three markets. Chart 22 shows that during August, gilt yields tended to move independently of both US Treasuries and bunds, while in July and September yield changes were more closely correlated. Chart 6 above compares the slopes of the UK, US and German government bond yield curves through the period. In all three markets, long yields rose relative to short-dated yields in September.

There were also several domestic influences on the gilt market. Changes to short-dated gilt yields were mainly driven by the same factors that affected money market interest rates (described above). Long-term gilt yields, however, were more affected by prospective changes to the demand for and the supply of gilts.

On the demand side, long-maturity yields rose through July and August in the run-up to the publication of the review of the Minimum Funding Requirement (MFR), undertaken by the Faculty and Institute of Actuaries for the Department of Social Security. The review had widely been expected to recommend changes to the MFR that would reduce pension funds' demand for gilts. Consequently, long-dated gilt yields rose by around 10 basis points in the few days leading up to the publication of the review on 14 September. However, yields then fell back by up to 7 basis points following publication. Although most participants had anticipated the review's main recommendations (see the box on page 334), the market was generally surprised that the government did not firmly endorse any of the review's recommendations, and that a further period of consultation would mean that implementation of any reforms is not likely until the end of 2001 at the earliest. The largest reaction following the release was in the market for non-government debt. AA-rated non-government bond yields at long maturities fell by 15 to 20 basis points in the week following publication, despite a strong increase in issuance.

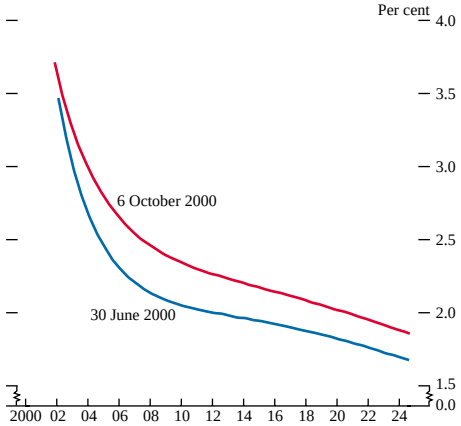
In terms of the supply of gilts, the release of the 2000 Spending Review (SR) on 18 July and the September fuel price protests led to market expectations of looser future fiscal policy. Though the SR left the overall envelope for public spending unchanged, it attracted both press and market interest as details of future spending commitments were released. There was also a strong increase in the issuance of sterling-denominated non-government bonds in Q3, which tended to add to the upward pressure on longer-maturity gilt yields as investors switched out of gilts and into non-government bonds. Announcements by the DMO concerning gilt auctions and buy-backs had only a limited impact on the gilt market.

On 20 July, the House of Lords ruled that The Equitable Life (a life assurance company) was not entitled to differentiate, when setting final bonuses, between policyholders depending on whether or not their policies contained Guaranteed Annuity Rates (GARs). Many of these GARs had been determined in the 1980s when long-dated gilt yields were significantly higher. The ruling led to an expectation that The Equitable Life, and potentially other life assurance companies, would have to purchase more gilts to offset their increased liabilities. Long gilt prices consequently rose and yields fell. However, the market price reaction was smaller than many market participants had expected, as it became apparent that other life assurance companies had already hedged their guaranteed liabilities.

Index-linked gilts

The index-linked gilt yield curve rose by up to 31 basis points during the review period (see Chart 23). Movements at the short end of the curve were dominated by technical factors. The most significant move followed the release on 15 August of the weaker-than-assumed figure for July RPI inflation; the five-year index-linked gilt yield fell by 13 basis points following this release. The rise in yields of medium and long-maturity index-linked gilts was more closely related to the factors that affected conventional bonds: notably the MFR and the SR. In addition, the DMO's index-linked auction of £425 million of 2½% Index-linked Treasury Stock 2013 on 26 July contributed to the rise in real yields, especially at medium maturities.

Chart 23
Index-linked gilt yield curve(a)



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

Gilt auctions

On 30 June, the DMO announced its Q3 gilt auction schedule, which comprised one index-linked gilt auction, one switch auction from medium to ultra-long maturity stock, and two reverse auctions (see Table F for details). The two reverse auctions were the first debt buy-backs by the British Government for 11 years, and accelerated the decline in the outstanding stock of gilts. The total market value of gilts outstanding has fallen from a peak of £347.4 billion in 1999 to £329.8 billion at the end of 2000 Q3.

Other sterling bond issues

Gross sterling bond issuance (other than gilts) was a record £26.1 billion in Q3, far exceeding the issuance in Q2 and in the third quarter of 1999 (see Chart 24). Issuance of both fixed-rate bonds, at £16.8 billion, and floating-rate notes, at £9.3 billion, were significantly higher than recorded in any previous quarter. Strong UK institutional demand for longer-dated sterling bonds continued,

The Minimum Funding Requirement review

On 14 September, the Government published the Faculty and Institute of Actuaries' (FIA) review of the Minimum Funding Requirement (MFR), together with a consultation document entitled 'Security for Occupational Pensions'.(1) The MFR was introduced as part of the 1995 Pensions Act, and is applied to the assets of 'defined benefit' occupational pension schemes. Defined benefit funds are those in which members' rights are defined in terms of benefits accruing, rather than contributions made (usually based on formulae related to final salary and length of service) and cover around 13 million members in the United Kingdom. Pension funds build up a stock of assets to cover these long-term liabilities, but there is no guarantee that the assets will be sufficient to fund a scheme's pension liabilities. The MFR test seeks to ensure that a defined benefit pension fund holds enough assets to balance its long-term pension liabilities, discounted over time. If the value of its assets are below the target level, then the fund has until 2003 to reach 90% of the MFR target level, and until 2007 to reach 100% of that level. Thereafter, if a fund falls below the target, then it is allowed one year to reach 90% of the target, and five years to reach 100% of the target.

The current MFR test values assets at market levels, while liabilities are discounted differently for those who have retired and for those who are yet to retire. For pensions already in payment, the discount rate is the prevailing market yield on a basket of gilts with a maturity of 15 years. For pension rights of members yet to retire, the discount rate is broadly the assumed long-term rate of return for UK equities before retirement and for gilts after retirement.

Over the past few years there has been increasing concern that the MFR has inappropriately influenced pension schemes' investment decisions. In particular, pension funds may hold more gilts as a hedge against short-term fluctuations in the MFR discount rate than would otherwise be the case. Furthermore, this increase in the demand for gilts appears to have been relatively price-insensitive. Together with the decline in the net issuance of gilts, excess demand has contributed to the inversion of the gilt yield curve since 1997. Reflecting these concerns, in March 1999 the Government commissioned the FIA to review the MFR.

The FIA's review recognised the above concerns, and also concluded that the current MFR formula does not suitably model future returns and risk on equities for assessing liabilities for pensions not yet in payment. The review recommended that if the MFR test is to continue to be used, it should be redesigned. In particular, it advocated that the liabilities for pensions in payment should be discounted using a composite index of gilts and investment-grade corporate bonds, while liabilities for pension rights not yet in payment should be discounted at a rate with a fixed premium of 1% per annum above this composite index.

The FIA recognised that it would be difficult to forecast what behavioural changes might occur if their proposals were implemented. For instance, some funds might take the more risk-averse route of switching out of equities into corporate bonds and gilts. They therefore recommended an extension of the time period allowed to bring the value of assets up to the MFR level, to help discourage a sub-optimal behavioural response to the regulations.

The Government's response to the FIA report indicated that it was willing to explore a more diverse range of possible solutions to the problem of security for occupational pensions. In particular, it noted that prudential supervision, compulsory insurance or a central discontinuance fund could replace or run alongside a revised MFR. The Government indicated that it would seek consultation in the context of the Myners' report on institutional investment, expected to be published in Q4. Market participants were surprised that the Government did not indicate its preferred future course of action more precisely, and that reforms would not be implemented more quickly.

(1) Available at: www.dss.gov.uk/publications/dss/2000/mfr/index.htm

Table F
DMO gilt auctions

Index-linked

Date	Stock	Amount issued (£ millions)	Cover	Real yield	Strike price
26.07.00	2½% Index-linked Treasury Stock 2013	425	1.94	2.18%	£195.45

Switch

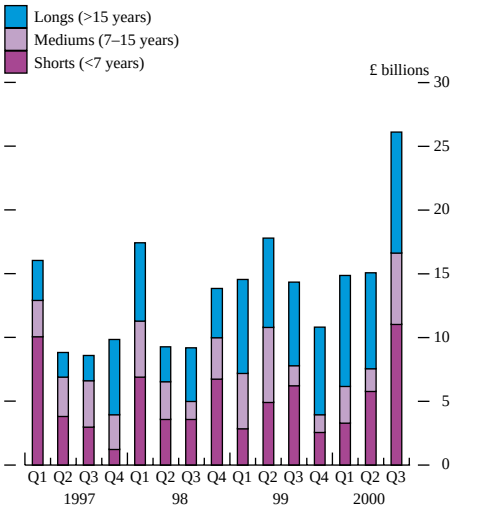
Date	Source stock	Total nominal amount purchased (£ millions)	Cover	Destination stock	Total nominal amount created (£ millions)
27.09.00	8% Treasury Stock 2015	1,500	1.61	4¼% Treasury Stock 2032	2,098

Reverse

Date	Source stock	Total nominal amount purchased (£ millions)	Lowest accepted price	Highest accepted yield
20.07.00	8% Treasury Stock 2003	381	105.39	5.94
	10% Treasury Stock 2003	357	111.48	5.93
	6¾% Treasury Stock 2004	0	n.a.	n.a.
	9½% Conversion Stock 2005	0	n.a.	n.a.
21.09.00	7¾% Treasury Stock 2006	130	110.11	5.72
	8½% Treasury Stock 2007	464	115.74	5.68
	9% Treasury Stock 2008	180	122.00	5.57

n.a. = not available.

Chart 24
Sterling-denominated non-government bond issuance



with £9.5 billion of over 15-year bonds issued in the quarter, more than 80% of which were fixed rate. However, the share of total issuance accounted for by shorter-maturity bonds also remained high for the second consecutive quarter, as expectations for the peak in UK short-term interest rates continued to fall and the degree of uncertainty about the peak diminished. The DMO's reverse auctions during the period (buying back stocks maturing between 2003 and 2008) are also likely to have contributed to the increased demand for short-dated sterling bonds.

There appears to have been a marked change in behaviour by UK institutional investors during the quarter, with increased demand for non-government securities. This has reportedly triggered some large-scale portfolio restructuring in favour of non-government bonds and away from equities and gilts. One reason for this shift in asset allocation is likely to have been the Minimum Funding Requirement (MFR) review, which was released on 14 September (see the box on page 334). The market had long anticipated that the report would recommend that the discount rate used in the calculation of defined benefit pension funds' liabilities should be based on a composite gilt and corporate bond index rather than a notional 15-year gilt yield. This probably encouraged greater investment in non-government sterling bonds in Q1 and Q2 this year and there was a further sharp increase in the issuance of such bonds in the second half of September. Fixed-rate bonds totalling £7.2 billion were issued in the four weeks after the report was released, compared with a monthly average of £3.8 billion in the first eight months of the year.

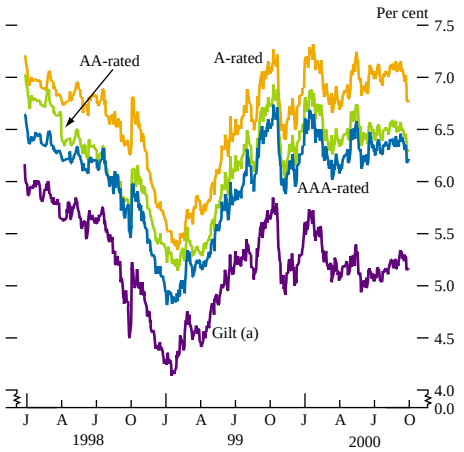
The narrowing of corporate bond spreads over the quarter (see below) and a greater willingness by pension funds and other investors to alter their portfolio allocations, even before the consultation period for the MFR review is complete, triggered significant orders to buy non-government sterling bonds. The relatively small size of the secondary market for sterling-denominated non-government bonds meant that these orders had to be accommodated largely by re-opening existing issues, with the new bonds either being pre-placed directly with end-investors or used to fill market-makers' short positions.

Table G
Sterling bond issuance in 2000 Q3

	Number of issuers	Amount (£ billions) Total	By credit rating: AAA	AA/A	BBB and below
Fixed-rate issues					
UK corporates	5	0.5	0.0	0.3	0.2
UK financials	9	2.2	0.2	2.0	0.0
Supranationals	8	5.2	5.2	0.0	0.0
Overseas borrowers	26	8.9	6.0	2.5	0.4
Total	**48**	**16.8**	**11.4**	**4.8**	**0.6**
FRNs					
UK corporates	3	0.6	0.0	0.5	0.1
UK financials	21	5.6	2.8	2.5	0.3
Overseas borrowers	16	3.1	0.3	2.8	0.0
Total	**40**	**9.3**	**3.1**	**5.8**	**0.4**

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

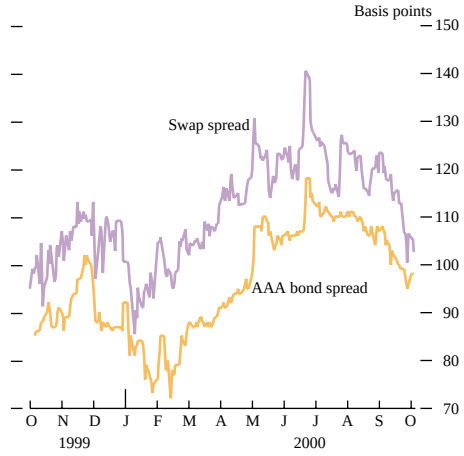
Chart 25
Ten-year sterling-denominated bond yields



Sources: Bank of England and Bloomberg.

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

Chart 26
Ten-year credit spreads versus gilts



Sources: Bank of England and Bloomberg.

Although fixed-rate issuance in Q3 was a record £16.8 billion, only £2.7 billion of this total was brought by UK firms (see Table G). The bulk of the £14.1 billion of sterling bonds brought by overseas borrowers was swapped into floating-rate liabilities denominated in dollars and euro.(1) As in previous quarters, this activity was largely driven by arbitrage opportunities in the swap market, together with the Libor-based funding targets of the borrowing institutions. Liquid AAA-rated bonds, issued via standardised medium-term note programmes, can be brought to the market quickly and with relatively little effort. In contrast, UK corporates are said to be slower to respond to investor demand, since they rarely have well-established medium-term note programmes in place and their new bonds often take longer to document and market. It is also suggested that UK investors tend to require more stringent covenants than international investors on sterling-denominated fixed-rate bonds; UK firms often prefer, therefore, to target international investors in the larger, more liquid US dollar and euro bond markets. Over the past two years, UK firms have raised only around one third of their bond financing in the sterling market.

The greater appetite for non-government sterling bonds triggered further index-linked bond issuance in the quarter. Tesco joined the limited number of UK firms issuing index-linked debt, bringing and then twice re-opening a 2016 bond to raise £200 million in total. However, as with conventional bonds during the period, much of the index-linked issuance (£460 million) was brought by AAA-rated international borrowers and swapped into floating-rate finance. This was facilitated by UK companies (mainly in the property and utility sectors) wanting to receive floating-rate interest to offset their funding costs, while matching their future expected real incomes against RPI-linked swap payments.

Though there has been demand to pay fixed in sterling swaps from UK borrowers raising funds in overseas asset markets, the upward pressure on UK swap rates seen in Q2(2) has been more than offset by the increased demand to receive fixed-rate interest by the AAA-rated borrowers mentioned above. As a result, longer-dated UK swap rates have fallen over the quarter, with much of the decline occurring after the release of the MFR review. Similarly, portfolio switching out of gilts and into non-government bonds in anticipation of, and following, publication of the review also led corporate bond spreads to narrow sharply in September (see Charts 25 and 26). The narrowing of corporate spreads, despite ongoing concerns about the financing needs of telecommunications companies to finance licence fees and other network-related investments, appears to have been the result of greater confidence among institutional investors.

Issuance of floating-rate notes also reached record levels in Q3. The mortgage and asset-backed bond market continued to grow, with several securitised deals being brought during the period, raising more than £4 billion. UK and overseas financials also issued almost £5 billion in short-dated notes in their own names, but issuance by UK and overseas corporates was negligible.

(1) Some of the £1.5 billion raised by overseas corporates may have been used to finance UK commercial operations, and some of the £5.2 billion bonds issued by supranationals may also have been swapped into floating-rate sterling for UK Treasury operations.
(2) See August 2000 *Quarterly Bulletin*, page 230.

Table H
Average daily money market shortages

£ millions

1996	Year	900
1997	Year	1,200
1998	Year	1,400
1999	Year	1,200
2000	Q1	1,800
	Q2	1,900
	July	2,000
	August	2,100
	September	2,300

Chart 27
Stock of money market refinancing and daily shortages

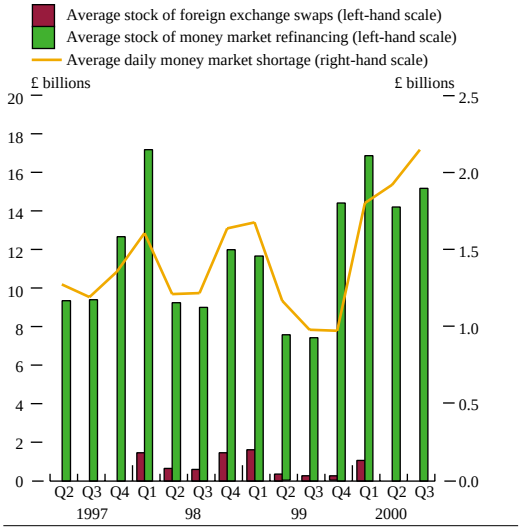
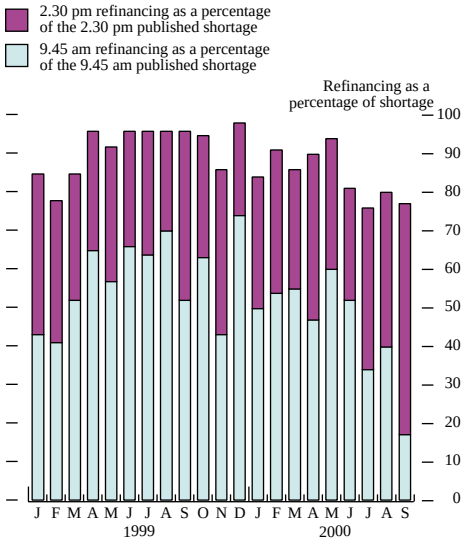


Chart 28
Refinancing provided at 9.45 am and 2.30 pm OMO rounds



Market operations

Open market operations

The stock of money market refinancing held on the Bank's balance sheet averaged £15 billion in Q3 (see Chart 27), some £1 billion higher than in Q2, reflecting the growth of the outstanding stock of notes in circulation. Daily money market shortages averaged £2.1 billion in Q3 (see Table H and Chart 27), the largest quarterly average since the Bank's money market reforms in March 1997. Partly because the quantity of refinancing required by the money market was relatively stable during the quarter, the Bank did not use foreign exchange swaps as an additional means of supplying liquidity.

In early-July and mid-August, short-term money market rates traded further below the Bank's repo rate than normal. The Bank responded by temporarily increasing the amount by which it left the market short after the 9.45 am round of operations when the available refinancing was fully bid by market participants. This led to a narrowing of the spread between short-dated market rates and the Bank's repo rate.

During the first half of September, there were a number of days when the money market shortage was not fully refinanced until the Bank's late rounds of open market operations. On average, only 30% of the daily money market shortages in Q3 were refinanced at the 9.45 am round (well below the long-run average of around 55%); and only 77% of the shortages were refinanced by the conclusion of the 2.30 pm rounds, compared with a long-run average of 90% (see Chart 28). Refinancing at the late rounds is available only on an overnight basis and is usually at penal rates of interest, above the Bank's two-week repo rate. The average maturity of the Bank's outstanding money market operations declined slightly, generating greater turnover in the stock of refinancing and larger daily shortages. For example, during the week of 11 September, the shortages ranged from £2.5 billion to £5.2 billion, well above typical previous levels. Consequently, the average size of the spread between the sterling overnight index average (SONIA) and the Bank's repo rate narrowed to -3 basis points in Q3 (see Chart 29). Since 1997, the average spread (excluding the Y2K period) has been -6 basis points. The average spread between the two-week GC repo mid rate and the Bank's repo rate was -16 basis points in Q3, consistent with its long-run average.

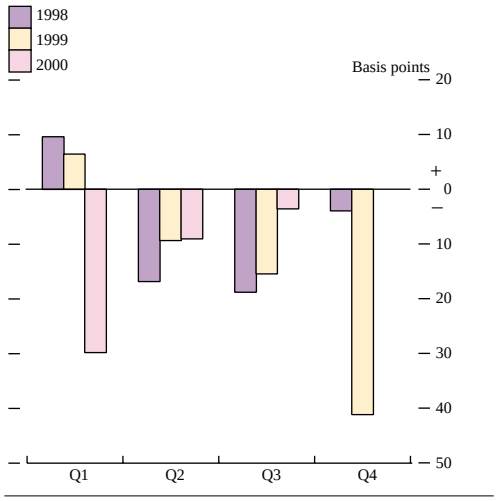
Gilt repo continued to account for around 70% of the collateral taken by the Bank in its open market operations in Q3. Euro-denominated eligible securities(1) accounted for 11% of the collateral (some £1.7 billion).

Bank of England and HM Treasury euro issues

In Q3, the Bank of England continued to hold regular monthly auctions 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

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

Chart 29
Quarterly averages of SONIA minus the Bank's repo rate



quarter. The auctions continued to be oversubscribed, with issues being covered an average of 5.3 times the amount on offer. During the quarter, bids were accepted at average yields of between euribid and euribid minus 6 basis points for the relevant maturity.

On 18 July, the Bank reopened the UK Government euro Treasury Note maturing on 28 January 2003 with a further auction for €500 million, raising the amount of this note outstanding with the public to €1.5 billion. Cover at the auction was 3.6 times the amount on offer and accepted bids were in a range of 5.30%–5.33%. Total notes outstanding with the public under the UK euro note programme thus rose from €5.0 billion at the end of the second quarter to €5.5 billion at the end of Q3. The final tranche of €500 million of the 2003 note was issued by auction on 17 October.

UK gold auctions

On 3 March 2000, HM Treasury announced plans for a programme of six gold auctions in the financial year 2000/01. Two of these auctions took place in Q3, with 25 tonnes of gold sold at each. The auction on 12 July achieved a price of $279.75 and was 1.3 times covered; the auction on 19 September achieved a price of $270.60 and was 2.6 times covered. The next auction in the programme took place on 7 November.