

Sterling wholesale markets: developments in 1999

- *Sterling wholesale markets grew by £800 billion in 1999, though much of this reflected increased market values rather than new issuance.*
- *Though the size of markets grew, liquidity in a number of core markets fell, reflecting both the retreat of risk capital following the global financial crisis of 1998 H2 and, in the gilt-edged market, reduced government borrowing and hence lower bond supply.*
- *The approach of the millennium date change also affected markets in 1999 H2, though liquidity and turnover in December turned out higher than many had expected.*
- *The Bank made two changes to its open market operations in 1999: a major permanent widening in the list of collateral eligible in OMOs; and, from October, the introduction of temporary three-month repos designed to help firms plan their liquidity over the year-end.*

Overview

The total size of sterling markets grew by £800 billion in 1999, as shown in Table A. At the end of 1999, sterling wholesale markets were equivalent in size to six years' UK nominal GDP. The largest amounts outstanding were in the interest rate swap and equity markets. Those markets grew by 16% and 25% respectively in 1999; most of this reflected increased market valuations, however, rather than new issuance. The money and corporate bond markets grew by around 9% and 23% respectively in 1999, while the gilt market contracted.

Table A
Size of sterling markets

Amounts outstanding; £ billions

	Money market	Gilts	Corporate bonds	Equities (a)	Swaps (b)	Total	Multiple of GDP
1990	181	125	60	486	167	1,019	1.8
1995	194	233	117	849	541	1,934	2.7
1998	433	301	203	1,334	2,360	4,631	5.5
1999 Nov.	473	296	249	1,664	2,732	5,414	6.3

(a) Measured as market capitalisation of FTSE All-Share index; 1990 data are estimated.
(b) Measured as notional principal outstanding; 1990 data are not available, so the table uses 1992 data; November 1999 data are also not available so June 1999 data are used. Figures quoted for 1998 and 1999 are for single-currency interest rate derivatives, which include forward-rate agreements and options in addition to the largest counterpart, swaps.

Though the size of sterling markets increased, the main feature of 1999 was the fall in liquidity. Two key factors lay behind this. First, following the global financial crisis in autumn 1998, risk-taking in nearly all financial markets was cut back, particularly in the first half of 1999. Second, improvements in the UK government's finances led to lower government bond supply. Liquidity was also affected, particularly during the second half of the year, by expectations of higher short-term interest rates in Europe

and the United States, and by the fall in trading and risk-taking ahead of the millennium date change.

Reduced liquidity meant that prices were at times quite volatile, and it became more difficult to interpret them and to infer from them market expectations about changes in interest rates or inflation. For example, at the long end of the gilt market, demand for stock was particularly price-inelastic and supply was constrained by the Government's strong fiscal position. The withdrawal of risk capital from financial markets was also one of the factors behind the sharp rise in implied future interest rates in the short sterling futures market.⁽¹⁾

Turnover and liquidity

Though the amounts outstanding in sterling wholesale markets rose in 1999, turnover and liquidity in a number of core markets fell (see Table B). Turnover of short sterling futures contracts fell by about a fifth to £54 billion (equivalent) a day. The open interest (amount outstanding) of short sterling futures contracts also fell during the course of the year (see Chart 1). Daily turnover in the cash gilt market averaged £5.3 billion during the first three quarters of the year, compared with £6.3 billion in the same period in 1998. Turnover in the long gilt futures market also fell—it averaged around £3.4 billion (equivalent) a day in 1999, compared with £4.9 billion a day in 1998.

Turnover in the gilt repo market, however, did not fall much in 1999: it averaged £13.6 billion a day, compared with £14.6 billion a day in 1998. And though there are no comprehensive turnover data in the unsecured interbank market, the limited evidence available suggests that turnover

(1) The gap between derived market expectations and economists' expectations was analysed in more detail on page 335 of the November 1999 *Quarterly Bulletin*.

Table B
Market turnover: average daily amounts

£ billions

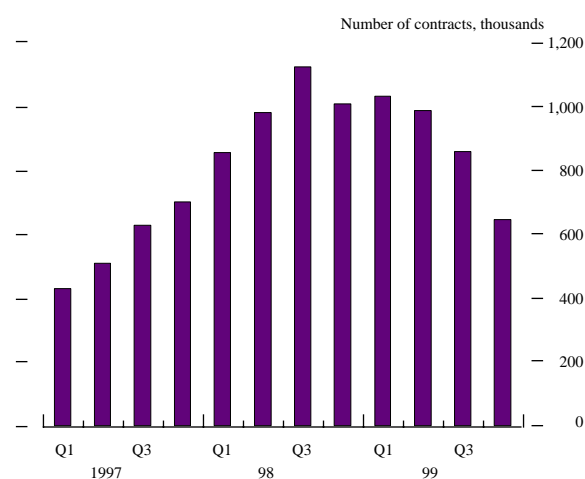
	1997				1998				1999			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Futures (a)												
Short sterling (b)	40.0	61.0	66.0	80.0	60.0	66.0	69.0	49.0	31.0			
Long gilt (c)	3.9	4.2	5.1	6.5	3.8	4.2	3.8	2.9	2.6			
Gilts												
Conventional	7.0	7.0	6.0	6.0	5.0	6.0	6.0	4.0	n.a.			
Index-linked	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	n.a.			
Money markets												
Gilt repo	14.8	11.4	16.8	14.7	15.5	12.6	13.5	15.8	12.4			
Overnight interbank	6.1	7.7	7.8	7.1	7.4	8.2	8.3	7.8	7.6			

n.a. = not available.

Sources: Bloomberg and London Stock Exchange.

- (a) Converted to equivalent nominal amounts.
 (b) Relates to the front 20 contracts traded in the quarter.
 (c) Relates to the front 2 contracts traded in the quarter.

Chart 1
Open interest of short sterling futures contracts traded on LIFFE at quarter-end^(a)



Source: Bloomberg.

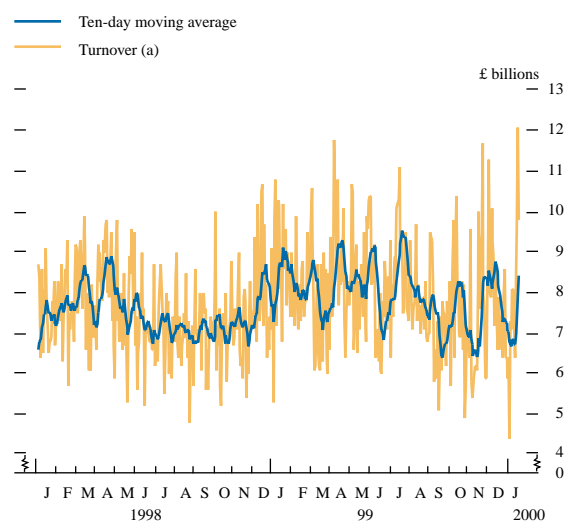
- (a) Relates to the front 20 contracts traded in the quarter.

did not fall in 1999. For example, the amount traded through brokers in the sterling overnight interbank market averaged £8 billion a day in 1999, compared with £7.5 billion a day in 1998 (the broked market accounts for around three quarters of total overnight interbank trade). Interbank volumes fell in December, though turnover rose in January 2000 (see Chart 2).

Falling turnover in some markets coincided with reports of reduced liquidity. In some cases this was reflected in a widening of bid-offer spreads; and in some cases it reportedly became more difficult to execute trades without affecting prices adversely. One indicator of reduced liquidity was the increased volatility of prices. The rolling thirty-day standard deviation of daily changes in thirty-year gilt prices rose from around 12% at the start of the year to 17% by the end of the year; by the same measure, the volatility of ten-year gilts rose from around 13% to around 18%.

In the gilt market, the single most important factor behind lower liquidity was the fall in government bond supply

Chart 2
Turnover in the overnight interbank market



- (a) Turnover as reported by brokers contributing to the sterling overnight index average.

relative to continued high, and price-insensitive, demand. Growing price-insensitive demand was particularly important at the very long end of the conventional market and in medium and long-maturity index-linked stock (partly because of regulatory and actuarial requirements which encourage institutional holdings of gilts—see below).

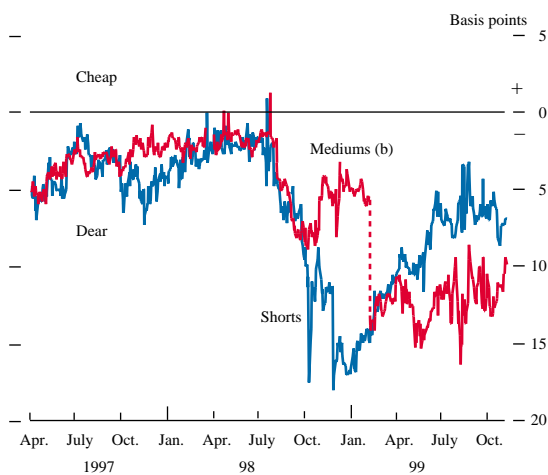
Three other factors helped to explain the broader fall in liquidity in sterling markets. First, there was reduced activity by hedge funds and proprietary desks, whose risk appetite fell following the Russian debt moratorium and the LTCM crisis in 1998 H2; this retreat of risk capital was particularly marked during the first half of 1999. A number of banks closed or scaled back their in-house proprietary bond trading units in 1999. Continuing bank mergers may also have had an impact on trading activity. Second, increases in official interest rates in Europe, the United Kingdom and the United States—and expectations of further rises—led to a bearish and cautious mood in money and bond markets. Third, the approach of the millennium date change added to the reluctance to trade actively: once desired year-end positions had been achieved, market players had little inclination to trade.

The introduction of electronic trading for futures contracts on the London International Financial Futures and Options Exchange (LIFFE)—in April for the long gilt future and in September for short sterling—prompted a debate among market practitioners about the likely impact of electronic trading on trading patterns and liquidity. However, there was little change in long gilt futures turnover between Q1 and Q2; and though short sterling turnover fell sharply in Q3, other factors, such as those mentioned above, were also relevant.

The spread of individual bond yields around the fitted yield curve is another indicator of the liquidity of the gilt market. If the gilt market were 'efficient' and without anomalies, then we might expect bond yields to trade very close to the

fitted curve. The extent to which they diverge from the curve (ie become ‘cheaper’ or ‘dearer’ relative to the theoretical yield) is a measure of the relative liquidity premia at different maturities. Chart 3 shows the cheap-dear history of five and ten-year benchmark stocks over the past three years. After the Russian debt moratorium in 1998 H2 these stocks became more expensive, as the ‘flight to liquidity’ caused these yields to fall relative to the fitted yield. More recently the ‘liquidity premium’ on benchmark stocks has lessened—they have become less ‘dear’ relative to the curve—but they are still dearer than they were for most of 1997. That suggests that gilt market liquidity has become more concentrated in benchmark stocks.

Chart 3
Cheap-dear: benchmark bonds^(a)



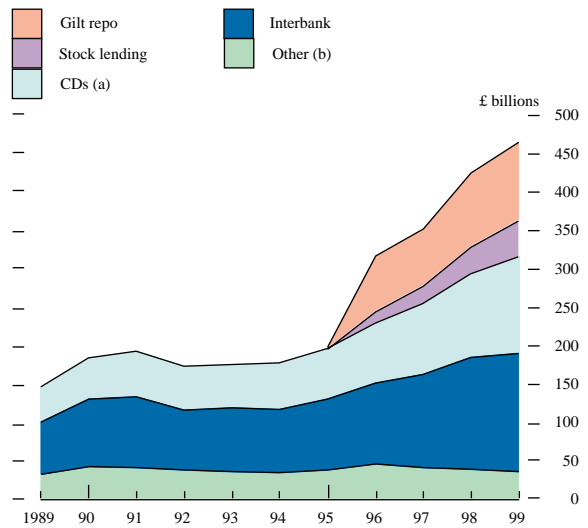
(a) Gap between conventional gilt yield and theoretical fitted yield.
(b) Series jumps in February 1999 as bond switches from one benchmark to another.

Money markets

Size and growth of money markets

The sterling money market grew by 9% in 1999.⁽¹⁾ Total outstandings were £473 billion at the end of November 1999, compared with £433 billion at the end of 1998 (see Table C and Chart 4). Interbank deposits, certificates of deposit (CDs) and gilt repo continued to account for the largest share of the money market (measured by outstandings). Treasury bill issuance was increased for

Chart 4
Sterling money markets: outstanding amounts



(a) Bank and building society certificates of deposit.
(b) Includes Treasury, eligible and local authority bills, commercial paper, and sell/buy backs.

money market management purposes and the commercial paper (CP) market expanded. By contrast, the value of eligible bills outstanding fell.

The interbank deposit market grew by 16% a year on average over the period 1995–98, but grew less quickly, by 5%, in 1999. Nevertheless, it continued to account for the largest share of the sterling money market (see Chart 5); it also continued to be the main means of distributing short-dated liquidity in sterling markets. The approach of the millennium date change may have constrained growth in unsecured (and non-tradeable) interbank exposures, though the CD and repo markets did not increase much in H2 either. One possible longer-term factor affecting growth of the interbank (and CD) markets is consolidation and mergers among financial institutions.

The value of CDs outstanding was £135 billion at end-November 1999, £13 billion higher than in December 1998, following rapid growth between 1994 and 1998 (see Chart 4). Two important structural factors have boosted growth in recent years. First, the sterling stock liquidity regime, introduced in 1996, made it attractive for

Table C
Sterling money markets^(a)

Amounts outstanding; £ billions

	Interbank	CDs	Gilt repo (b)	Treasury bills	Eligible bills	Stock lending (b)	Commercial paper	Sell/buy backs (b)	LA bills (c)	Total
1990	89	53	n.a.	9	23	n.a.	5	n.a.	2	181
1995	93	66	n.a.	8	20	n.a.	6	n.a.	2	195
1998	150	122	95	1	17	35	10	2	1	433
1999 Nov.	155	135	100	5	12	49	13	3	1	473

n.a. = not available.

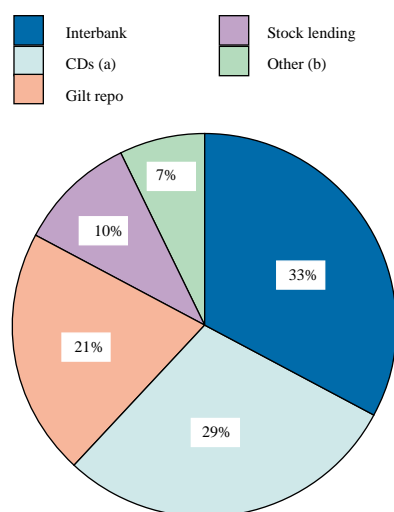
(a) 1990 and 1995 data are end-March; other data are end-period.

(b) End-November data.

(c) Local authority bills.

(1) The sterling money market is defined for this purpose as the sum of the outstanding amounts in the interbank, certificate of deposit, gilt repo and stock lending, Treasury bill, eligible bank bill, local authority bill and commercial paper markets.

Chart 5
Sterling money markets: outstanding amounts
November 1999



(a) Bank and building society certificates of deposit.
 (b) Includes Treasury, eligible and local authority bills, commercial paper, and sell/buy backs.

banks to fund themselves using CDs, because up to 50% of their five-day wholesale liability outflows could be offset in the calculation of required liquidity with holdings of other banks' CDs (subject to a 15% 'haircut'). Second, CDs are used as collateral in stock borrowing, so that, after the advent of the gilt repo market in 1996, CD activity expanded alongside gilt repo (see below).⁽¹⁾

The gilt repo market grew very little in 1999: the amount outstanding at the end of November 1999 was £100 billion, compared with £95 billion a year earlier. The market grew rapidly from its opening in 1996 and, according to some market contacts, has now reached the point at which substantial further growth may require structural innovation, such as the planned introduction next year of a central counterparty to facilitate the balance sheet netting of inter-dealer gilt repo trades, and the introduction of electronic trading.

There was £49 billion of stock lending outstanding at end-November 1999, up from £35 billion a year earlier. Stock lending and repo have a complementary relationship: 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 cash collateral and would therefore require constant monitoring of the short-term money markets. Instead, they prefer to lend stock to intermediaries in return for a flat fee. Those intermediaries then repo the gilts on to banks and securities houses. High demand for gilts in 1999, when new supply was low, may have led to more borrowing from end-investors and hence greater use of stock lending.

The Treasury bill, eligible bill and CP markets are small compared with the interbank, CD and repo markets. Treasury bill issuance was used actively during 1999 to offset large prospective changes in the stock of (short-term) money market refinancing and hence in liquidity conditions. In February, the Bank introduced a one-month tender (to run alongside the regular three-month tender) for the first time since 1997; one-month bills allow more flexibility to affect the outstanding stock of refinancing quickly. On three occasions in November and early December the Bank sold Treasury bills maturing on 30 December; the maturing of the bills reduced what would otherwise have been a large money market shortage on that day.

The amount of CP outstanding also rose during the year, to £13 billion at end-November 1999, up from £10 billion at the end of 1998. The eligible bill market contracted in 1999 to £12 billion at end-November, from £17 billion at end-1998. This fall in issuance may have partly reflected the widening of collateral eligible for use in OMOs during the past three years. Previously, eligible bank bills had been the 'swing' element in OMO assets, so that when the stock of refinancing rose, the eligible bill market would also expand as it became more attractive to draw bills (because bill rates were pushed down relative to other money market rates by the higher demand for bills in the OMOs). Gilt repo now mostly fulfils the role of swing element in the OMOs.

Open market operations

There were two major changes to the Bank's open market operations (OMOs) in 1999:

- a major, permanent, widening in the range of collateral eligible for OMOs; and
- temporary changes to the Bank's liquidity provision ahead of the millennium date change.

The Bank has widened the amount of collateral eligible in its OMOs in the past few years. Before 1997, eligible bills were the main instruments against which the Bank provided sterling liquidity. From March 1997, the Bank accepted gilts on repo as part of its daily operations.⁽²⁾ And from autumn 1998 to summer 1999, the Bank made three further extensions to the list of collateral eligible in its operations; the last extension resulted in a sixfold increase in the eligible pool to around £2 trillion (see Table D). The box below describes the collateral extension in 1999 in more detail.

One of the objectives of the extension of collateral was to alleviate pressure on the existing pool of collateral. That pressure reflected the fact that such assets were in demand not only for use in OMOs with the Bank (and for intraday

(1) The expansion of eligible collateral in 1999 to include euro debt may mean that CD issuance will be driven less by these factors in future.

(2) Gilt repo had been used in the Bank's fortnightly 'rough-tuning' facility since January 1994 (the rough-tuning facility was introduced temporarily in 1992).

Extension of eligible collateral in OMOs

The Bank has extended the range of collateral eligible in its sterling OMOs in three stages. The process began in autumn 1998, when certain sterling and euro-denominated bulldog bonds were accepted in the Bank's operations. In the second stage, from 28 June 1999, the Bank extended the securities it accepted to include a range of bonds issued by other central governments in the European Economic Area (EEA) and the major international institutions, where they have been issued directly into the Euroclear and Cedel settlement systems. The Bank accepts bonds issued by these bodies denominated in sterling, and denominated in euro where they are eligible for use in ESCB monetary policy operations.

The third, and largest, phase of collateral extension took effect at the end of August 1999. The pool of securities was extended to include securities denominated in euro issued by the central governments and central banks of the countries of the EEA which are eligible for use in ESCB monetary policy operations, where the central bank in the country in which the relevant securities were issued has agreed to act as the Bank's custodian under the Correspondent Central Banking Model (CCBM). (Because of the settlement timings and lags, CCBM securities are only eligible for use in the 9:45 am round of operations or in the 12:15 pm round on the day of an MPC announcement.) This third phase expanded the range of eligible collateral more than sixfold, to more than £2 trillion.

liquidity in the payments system), but also to meet the FSA's sterling stock liquidity requirement. As an indicator of the relative scarcity of this collateral, Table D shows the stock of eligible assets outstanding and the proportion held by the Bank as assets against which sterling liquidity had

Table D
Collateral eligible in open market operations

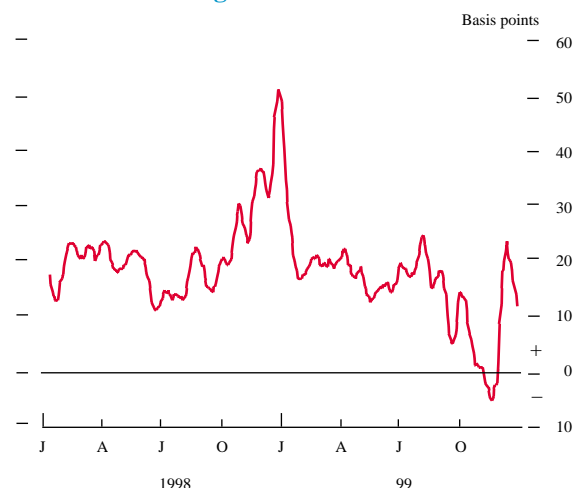
End-year	£ billions	of which, held at Bank (per cent)
1990	37	13
1995	30	11
1996	34	14
1997	320	2
1998	327	3
1999	2,325	1

Note: 1995 and 1996 data exclude gilts held in the rough-tuning facility.

been provided. The latest extensions of eligible collateral mean that a much smaller proportion of eligible collateral is now 'locked up' at the Bank: the Bank held about 1% of the stock of eligible collateral at the end of 1999, compared with 14% at the end of 1996.⁽¹⁾

Extensions to the eligible collateral pool have led to changes in relative yields on previously eligible assets. Eligible bank bill rates and general collateral repo rates have risen relative to yields on money market assets that are not eligible, such as interbank deposits and CDs. Chart 6 shows the narrowing spread between eligible bill and CD rates after August 1999 when the last and largest of the 1999 collateral extensions came into effect, illustrating that the relative 'dearness' of eligible assets fell in the second half of the year (the rise in spread in December 1999 was Y2K-related).⁽²⁾

Chart 6
CD rate minus eligible bill rate^(a)



(a) One-month offer rate, ten-day moving average.

The extension of eligible collateral, though not introduced as a specific Y2K measure, helped to reassure the market that there would be adequate eligible collateral in the run-up to the end of the year. Other countries, such as the United States and Japan, extended the range of collateral eligible in their monetary policy operations, though in both these cases the extensions were temporary.

The Bank made one temporary adaptation to its sterling liquidity operations that was principally designed to address Y2K liquidity concerns. From 13 October, the Bank supplemented its regular two-week repo operations with three-month floating interest rate repos spanning the year-end. In December, these three-month repos were replaced with two-month repos. The purpose of these longer-duration repos was to give market participants an additional tool to help plan and manage their liquidity over the year-end. By providing term financing over the year-end, the Bank enabled counterparties to extend term credit without exposing themselves to roll-over risk on shorter-term liabilities. The longer-term repo operations were well-used: by the end of the year, £8 billion of the Bank's refinancing had been provided through them. That helped to reduce the amount of money market refinancing turning over each day. Both on the day that the Bank

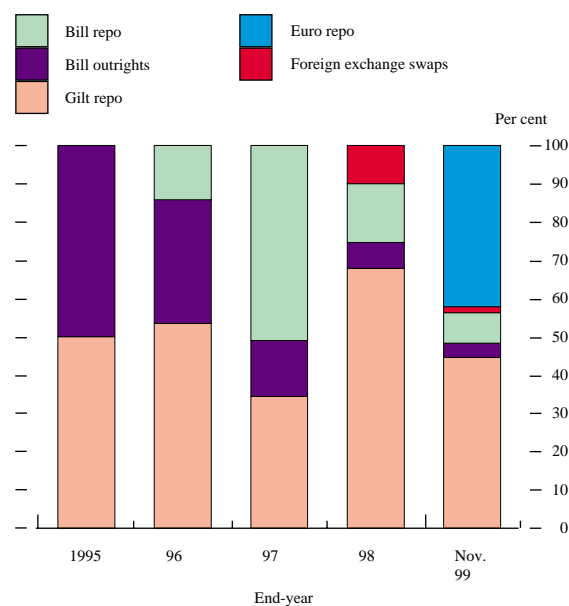
(1) The figure of 14% in 1996 excludes refinancing through the fortnightly rough-tuning facility.

(2) Low daily money market shortages may have also reduced the premium on eligible assets towards the end of the year.

announced the long-term repo facility, and on its first day of use (when the full £3 billion on offer was taken up), the implied interest rate on the December 1999 short sterling futures contract fell (by 9 and 7 basis points respectively). This indicated that the term repos increased market confidence about liquidity provision in the final months of the year and helped to reduce pressure on term funding rates. In the event, the transition to the new millennium was smooth: markets functioned in an orderly way, with more turnover and liquidity than some participants had expected (see the box on pages 18–19 of the ‘Markets and operations’ article).

Chart 7 shows the share of the stock of refinancing held at the Bank accounted for by different instruments over the past few years. Euro-denominated assets accounted for an increasing share after 31 August, as some counterparties substituted them for gilts on repo, though the biggest change followed the introduction of the long-term repo facility: from mid-October the share of the stock of refinancing accounted for by euro-denominated assets rose quickly to around 40% at the end of December.

Chart 7
Stock of refinancing: instrument share



Note: 1995 and 1996 gilt repo data are repos under the rough-tuning facility.

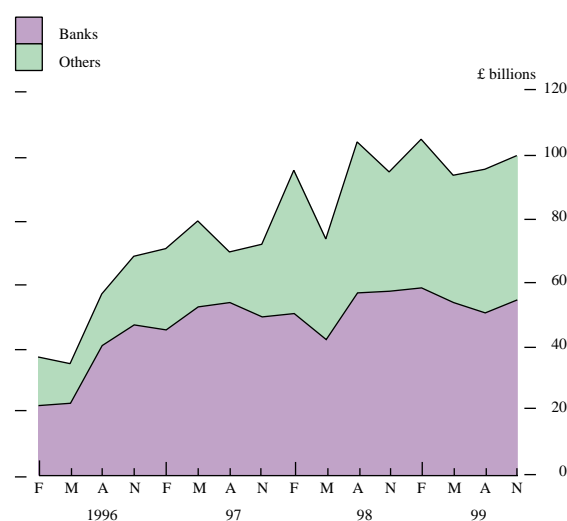
Gilt repo market

There was little growth in the gilt repo market in 1999, according to the Bank’s quarterly survey of the main market participants. After the global financial market turmoil of 1998 H2, there was less appetite for risk by the main players, and those that had used repo in leveraged trades in 1998 were less active in 1999. The millennium date change may also have dampened activity towards the end of the year. However the prospective introduction of netting and electronic trading systems in 2000 may boost repo activity

(after netting was introduced in the United States, the repo market grew rapidly).

Chart 8 shows repo market activity broken down between banks and other counterparties (such as securities firms and specialised repo brokers). The banks have the largest share of the market but, since the middle of 1997, the non-bank sector has been largely responsible for the growth of the market. The activity of the non-bank sector is also more variable: securities houses, for example, are more sensitive to balance sheet measures used by rating agencies, and scale back their repo activity at certain times of the year more than banks do. They are also more active in using repo to take views on interest rates, whereas the banks’ interest rate views may be expressed also through the CD or interbank markets. The FSA’s sterling stock liquidity regime, and banks’ own internal liquidity guidelines, also give retail banks an incentive to hold gilts, outright and on reverse repo, on a longer-term basis than securities houses.

Chart 8
Repos by banks and others



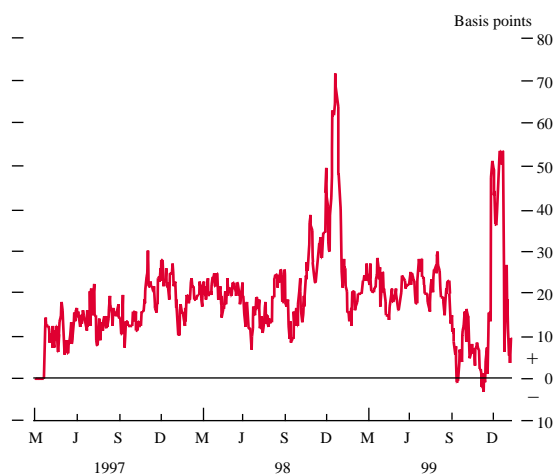
Specials activity over the year was concentrated on two bonds.⁽¹⁾ First, 6% Treasury 2028 was consistently special because it remained in heavy demand in the cash gilt market (see capital markets section). Second, 9% Treasury 2008 was in demand for delivery into the long gilt futures contract because of its status as the cheapest-to-deliver (CTD) by a large margin over other bonds. So in all term trades to the date of contract expiry it showed special rates varying from twenty to several hundred basis points below general collateral (GC) levels. However, this bond dropped out of the delivery basket for the March 2000 futures contract, with 5³/₄% Treasury 2009 becoming the CTD. The latter bond is therefore expected to be actively traded in the specials market this year, though the difference in cheapness to deliver between it and the next CTD is smaller than had been the case with 9% Treasury 2008.

(1) Using gilts in the repo market where the gilts received are not specified is known as ‘general collateral’ (GC) repo. When a stock is difficult to obtain, its repo rate will fall below the prevailing GC rate. If it is more than 5–10 basis points below GC it is said to be trading ‘special’.

Over the summer, the repo rates for a number of shorter-dated bonds maturing in 2000–02 also dropped below GC rates. These are gilts that are held as assets by money market participants and are frequently used by them in the Bank’s daily OMOs; they were therefore expected to acquire value over the millennium date change due to the expected large money market shortages at the time, and because they represented a means of ready access to cash in the event of unexpected need. In fact, after the widening of collateral eligible for the Bank’s OMOs towards the end of the summer, these bonds lost their special status.

Chart 9 shows the spread between interbank and GC repo rates at the one-month maturity since March 1997. The unsecured rate remained above the repo rate for nearly all of this period, with the gap mostly ranging between 10 and 30 basis points. However, the gap widened sharply at the end of 1998, following the financial turbulence of autumn 1998 and the uncertainties about placing unsecured money over the changeover to the single European currency. The spread fell from September 1999, due partly to the expansion of eligible collateral; it widened in December 1999 ahead of the century date change; but then fell in the new year.

Chart 9
Gap between repo and interbank rates at one month^(a)

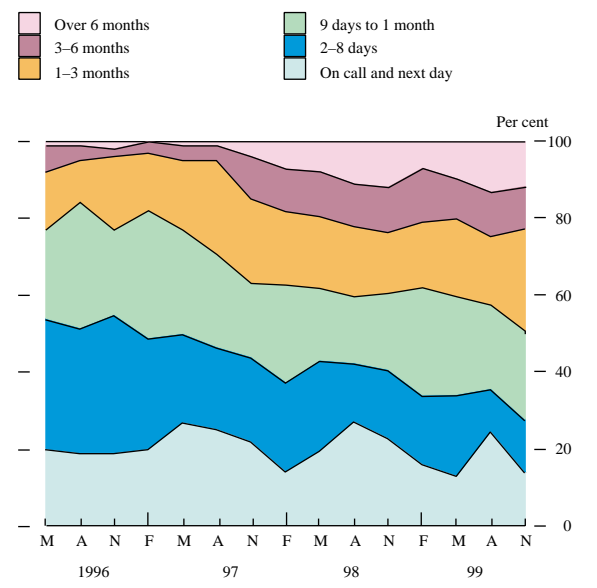


(a) General collateral repo (bid) minus interbank offer rate.

The maturity of gilt repo trades outstanding, shown in Chart 10, varies by type of participant; those that are very active in OMOs, are constrained by capital usage, or use repo mainly to fund other assets, tend to operate at the short end of the curve. Participants who use matched-book repo positions to take views on the path of future interest rates find a niche in the longer maturities. As the chart shows, the share of repo trades at one to three months rose at the end of 1999. That was the counterpart to the rise in reverse repo activity as firms reversed in gilts over the year-end.

The reduction in risk appetite in the gilt repo market was reflected in a rise in the concentration of the market. The

Chart 10
Maturity of trades outstanding in the gilt repo market



share of the largest five counterparties (measured by amounts outstanding) rose from 41% to nearly 50% in 1999, suggesting that firms that did not have a core repo business scaled down their operations after the experiences of 1998 H2.

Capital markets

Size and growth of capital markets

Table E shows the overall size of sterling debt and equity markets. By the end of 1999 the market capitalisation of the FTSE All-Share index was about three times that of the sterling bond market. The sterling debt market expanded in 1999, with a rise in net corporate issuance more than offsetting a fall in the amount of gilt-edged securities outstanding. The sharp improvement in public finances (described below) reduced the need to raise funds in the gilt market.

Gilt-edged market

The gilt financing requirement for 1998/99 was initially estimated by HM Treasury at £14.2 billion; the final outturn was £4.1 billion. Consequently, with gilt sales for the year of £8.2 billion, an overfinancing of £4.1 billion was carried forward to 1999/2000. The estimated requirement for 1999/2000 has also been revised down (see Table F). A total of £17.3 billion of gilt sales were originally planned in March 1999; however, the estimate was reduced to 14.2 billion in the November Pre-Budget Report. This triggered the cancellation of the short-maturity auction scheduled for March. With total gilt redemptions of £14.9 billion and planned sales of £14.2 billion, there is likely to be a net debt repayment in 1999/2000.

This fall in gilt supply coincided with strong and price-insensitive institutional demand for gilts (see below). As a result, gilt yields were depressed at ultra-long maturities and, with short gilt yields rising in anticipation of

Table E
Sterling capital markets

Amounts outstanding and issued; £ billions

	Amounts outstanding				FTSE All-Share (c)	Gross issuance	
	Gilts (a)	Corporates (b)	of which, on issue programme	Total		Gilts	Corporates (d)
1990	125	60	0	185	486	3	12
1995	233	117	14	350	849	31	13
1998	301	203	61	504	1334	8	47
1999	296	249	85	545	1664	11	57

Note: Corporate outstandings are compiled from a different data source from that of gross issues, and so may not give directly comparable figures.

- (a) Nominal value at end-March, except where stated. 1999 data are end-November for outstandings and end-September for issuance.
 (b) These figures include both domestic and international issuance and give the nominal value at period-end. They have been calculated ignoring call and put options; had these been exercised, total outstandings would typically have a value of around 85% of the figure quoted.
 (c) Market capitalisation of FTSE All-Share index at period-end; 1990 data are estimated; November 1999 uses 14 December 1999 data.
 (d) Non-government international bond issue in sterling.

Table F
Gilt financing requirement 1999/2000

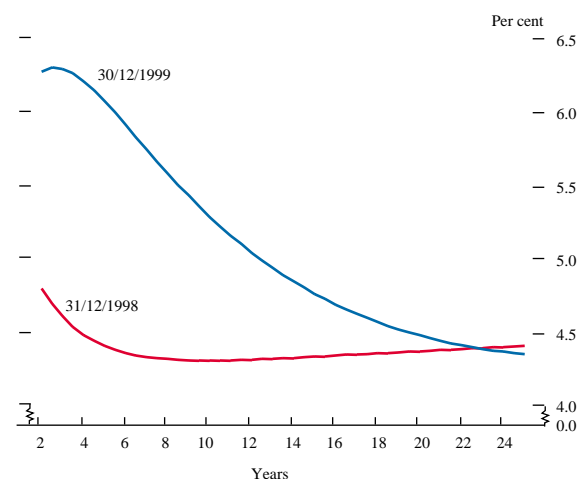
£ billions

	Remit	Revision (20/4)	Pre-Budget Report
CGNCR forecast	6.2	6.2	1.1
Finance for forex reserves	2.4	2.3	2.3
Gilt redemptions	14.8	14.9	14.9
Gilt sales residual 1998/99	-2.3	-4.1	-4.1
Financing requirement; minus	21.0	19.3	14.2
Sales by National Savings	0.1	0.1	-0.9
Net increase in Treasury bills	3.6	1.9	0.8
Gross gilt sales required	17.3	17.3	14.2

Source: Debt Management Office.

higher official interest rates in 2000/01, the yield curve became increasingly inverted (see Chart 11). Market conditions also became less liquid. Strong price-insensitive institutional demand for index-linked bonds also put downward pressure on index-linked yields.

Chart 11
Gilt (zero coupon curve)

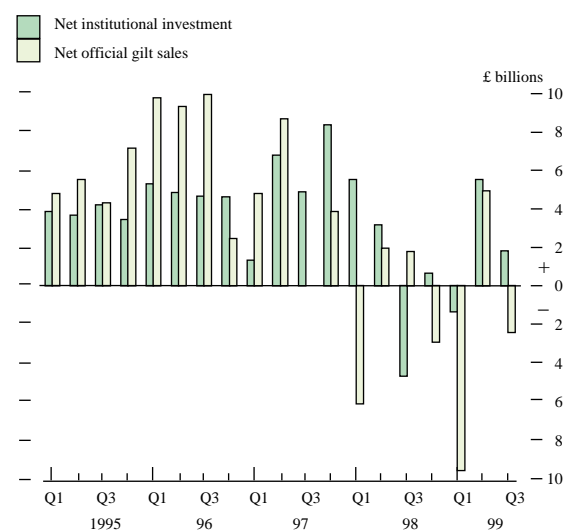


Note: Derived from Svensson par yield curves.

Institutional behaviour

Net investment in gilts by institutions (pension funds, insurance companies and trusts) was around £6 billion in the first three quarters of 1999, and continued the recent trend (broken in 1998 Q3 only) of exceeding net gilt issuance (see Chart 12). Institutions' share of the gilt stock therefore increased during the course of 1999. In H1, increased

Chart 12
Gilts: net institutional investment and net official sales



Source: Office for National Statistics.

institutional investment coincided with a net fall in gilt holdings by the rest of the M4 private sector and by banks. In Q3, the increase coincided with a large fall in gilt holdings overseas.

The largest component of the net increase in institutional gilt investment has been by pension funds. As they mature, pension funds naturally increase their bond holdings to meet pension-in-payment liabilities. In addition, the operation of the Minimum Funding Requirement (MFR) may have reinforced the tendency for funds to switch towards bonds, and gilts in particular. This is because the MFR requires a comparison of current asset values with pension liabilities; in the comparison, future liabilities relating to pensions either already in or approaching payment are discounted by index-linked or conventional gilt yields, depending on the nature of the liability. Matching liabilities with gilts therefore reduces the risk of funds falling short of the MFR, regardless of the level of gilt yields.

Furthermore, if gilt yields fall, future liabilities are discounted at a lower rate. If equities are held to match such liabilities, a scheme may suffer a reduction in the MFR

funding position if equity and gilt performance deviate. In this situation, in order to hedge against the risk of not meeting the MFR, funds may seek to increase the gilt component of their assets. So falling gilt yields may encourage pension funds to invest in gilts, adding further downward pressure on yields.

The next largest component of the net increase in institutional investment has been by life insurance companies. Their investment has been related to efforts to hedge against minimum annuity rate guarantees which they issued to policy-holders some years ago at levels well above current market annuity rates. A fall in bond yields can threaten regulatory solvency, because the duration of companies' liabilities is often longer than that of their assets. So a fall in gilt yields can increase companies' asset/liability mismatches and consequently reduce reserves, which are required to meet resilience tests. Insurance companies may respond by buying gilts to hedge risks, which can reinforce the downward pressure on gilt yields.

Long-dated 'swaptions' also affected market dynamics in 1999. These are options to enter into a long-maturity forward swap, receiving fixed income and paying floating, at expiry of the option. One example of such an option would be the right to receive fixed interest, and pay floating-rate interest, for 15 years beginning in 15 years' time. Some insurance companies with guaranteed annuity rate liabilities have hedged their long fixed-rate liabilities by buying long swaptions. Firms that have sold these swaptions become increasingly exposed as gilt yields fall, and have hedged their positions by buying gilts or contracting to receive fixed interest in swaps (and those paying fixed in swaps may in turn need to hedge themselves by buying gilts). Such dynamics may have reinforced the gilt market rally in late October/early November.⁽¹⁾

Non-government sterling bonds

The size of the non-gilt sterling debt capital market grew further in 1999 (see Table E). By the end of November 1999, the amount outstanding in these securities was nearly £250 billion, more than 20% higher than a year earlier.⁽²⁾ Gross non-gilt issuance denominated in sterling increased sharply during 1999 to £57 billion, up from £47 billion in 1998, and more than four times the amount of gross gilt supply in 1999. Issuance was strong during the first half of the year, as borrowers were keen to revive their funding programmes following the disturbances to markets in the second half of 1998. Some borrowers were also keen to raise capital well before the end of 1999 because of concerns that investors might be reluctant to lend in the run-up to the millennium date change.

Much of the non-government sterling issuance was targeted at UK fund managers seeking to invest in sterling fixed-income securities while maintaining investment returns. UK corporate issuers were able to raise long-term finance at historically low interest rates, and lower-rated companies (even sub-investment grade) gained greater access to capital markets. Strong and price-insensitive demand for long gilts put downward pressure on long swap rates, though there was some widening of swap spreads. This gave AAA-rated borrowers the opportunity to raise cheaper floating-rate finance by issuing fixed-rate sterling bonds and swapping the cash flows into floating-rate sterling, dollar or euro liabilities. The demand for sterling fixed and floating-rate paper also facilitated the growth of securitisation as a corporate finance medium. Long-standing structures used to repackage financial products (mortgages, consumer loans and credit card receivables) into tradeable bonds have been adapted to allow capital to be raised against future income streams from a variety of other assets (ranging from nursing home properties to public houses). This has facilitated the refinancing of corporate takeovers, as well as capital development projects, including those under the government's Private Finance Initiative.

Sterling debt issue programmes (a subset of the non-government issuance described in the previous two paragraphs) have proved to be an increasingly attractive fund-raising channel in recent years: the amount outstanding doubled to £85 billion between the beginning of 1998 and the end of November 1999. Once the necessary documentation and administration is in place, borrowers find debt issue programmes a cost-effective, convenient and flexible way to access capital markets. Under the programme scheme, debt can be issued at any maturity over a year.⁽³⁾ Supranationals and (overseas) government-backed agencies have been among the largest issuers, with much of the issuance driven by swap arbitrage opportunities, where proceeds are swapped back into 'home' currency (in which most of a borrower's liabilities are held). For borrowers with high credit ratings (typically AAA), the most attractive opportunities have generally occurred at very long maturities; the issues have met with high demand by UK pension funds and insurance companies seeking products that are a near-substitute for gilts.

However, while there has been strong demand for non-government bonds, the fact that corporate bonds are not perfect substitutes for gilts limits the 'crowding in' caused by low gilt issuance. Fund managers may not wish to accept the higher credit risk, while regulatory or actuarial and trustee limits may discourage or prevent greater investment in corporate bonds instead of gilts. Fund managers may also fear underperforming their benchmark if continued strong

(1) See the 'Markets and operations' article on pages 5–22 for a discussion of gilt market developments in 1999 Q4.

(2) This represents non-government UK and international bond issue in sterling, according to Capitaldata Bondware. This figure includes bonds with call or put options and assumes that none of the options is exercised; if all of the options had been exercised, then the amount outstanding would have been £210 billion.

(3) This sector has developed from the medium-term note (MTN) market, since the five-year maximum maturity restriction was removed in April 1997.

demand for gilts causes a widening of corporate bond spreads.

Derivative markets

Size and growth of the interest rate swap market

During the 1990s, derivative instruments, including interest rate swaps, have assumed a growing importance in over-the-counter (OTC) trading and in transforming and managing risk. The term 'derivative' covers a range of financial products, including forward-rate agreements, options and swaps. According to data collected by the Bank for International Settlements (BIS), swaps accounted for nearly three quarters of the total notional amounts outstanding in sterling interest rate derivatives at the end of June 1998.⁽¹⁾ Here we use two indicators of activity in the sterling single-currency swap market. Data from the BIS mostly record notional values, which can give a good indication of the amount of underlying business being traded and the potential for future gains or losses. By contrast, Bank of England data, which are more up-to-date, record marked-to-market values of UK banks' derivative positions.

Data from both sources suggest that the rapid growth of the sterling interest rate swap market during the mid-1990s may have started to slow in 1999. At the end of June 1999, the BIS estimated that the notional amount outstanding on sterling interest rate derivative contracts was £2.7 trillion (see Table G). That was 16% higher than a year earlier, compared with annual growth rates of 30%–60% between 1993 and 1996. Though much of the activity generated by leveraged players in the swaps market was wound down in 1999, the hedging of new bond issues, mortgage books and

guaranteed annuities still generated a significant amount of business. The gross market value of sterling interest rate derivatives fell by nearly 20% in 1999 H1 to £64 billion.⁽²⁾ This fall followed a sharp rise in gross market values at the end of 1998, probably reflecting a rise in activity to neutralise the effect of the changes in stock and bond markets on existing positions following the Russian and LTCM crises.

Bank of England data show a fall in swap market activity in 1999. By the end of 1999 Q3, the marked-to-market value of sterling single-currency interest rate swaps fell to £38 billion, from £52 billion in 1998 Q4 (see Table H). The fall in marked-to-market positions during 1999 reflected both a fall in swap market activity and price changes in the underlying markets. Typically, yield curve movements have been the dominant influence on the value of marked-to-market positions, though in 1999 Q3 contacts cited subdued business activity as the main explanation of the fall in the value of positions. (At the aggregate level, the link between changes in the yield curve and swap market values is not straightforward, partly because it depends on the precise shape of the curve at the time of trading, and the exact maturity of the swaps undertaken.⁽³⁾)

Table H
Sterling single-currency interest rate swap positions^(a)

£ billions			
	Assets	Liabilities	Net
1998 June	35	38	-3
Sept.	40	39	1
Dec.	52	55	-3
1999 Mar.	55	57	-2
June	45	45	0
Sept.	38	39	-1

(a) Banks; at market values.

Table G
Sterling single-currency interest rate swaps^(a)

£ billions		
Year (b)	Amount outstanding (c)	New swaps (d)
1992	167	n.a.
1993	291	175
1995	541	275
1998	2,360	78
1999	2,732	64

n.a. = not available.

Source: BIS.

- (a) Figures quoted for 1998 and 1999 are for single-currency interest rate derivatives, which include forward-rate agreements and options in addition to the largest counterpart, swaps. The BIS quoted these figures in US dollars; they have been converted to pounds using year average exchange rates.
 (b) Year-end values are used for 1992–98, and the end-June value for 1999.
 (c) This is expressed in terms of the notional principal outstanding, and has been adjusted by the BIS for double-counting for 1998–99.
 (d) This is expressed in terms of the notional principal outstanding for 1992–97, and the BIS definition of gross market value for 1998 and 1999.

- (1) See the BIS triennial central bank survey of foreign exchange and derivative market activity published in May 1999.
 (2) Gross market value is defined as the sum (in absolute terms) of the positive market value of all reporters' contracts and the negative market value of their contracts with non-reporters (as a proxy for the positive market value of non-reporters' positions). It measures the replacement cost of all outstanding contracts, had they been settled on 30 June 1999.
 (3) Changes in the gross marked-to-market value of derivative contracts will be influenced by three main factors:
 (i) Revaluations due to changes in the underlying instruments; when derivatives contracts are traded, their marked-to-market value will typically be zero.
 (ii) Transactions in financial derivatives; because the marked-to-market value of a derivative is equal to the net present value of future payment streams, whenever a payment is made the marked-to-market valuation will be affected.
 (iii) Changes in the number of contracts held; the more contracts that are traded, the higher will be gross marked-to-market positions.

Introduction of LIFFE CONNECT™ during 1999 for trading financial futures contracts

In 1999 there was a major shift toward screen-based trading on LIFFE affecting the key short sterling and long gilt futures contracts. LIFFE CONNECT™, LIFFE's proprietary order-matching system, was implemented on 30 November 1998 for individual equity options contracts and was rolled out during 1999 for financial futures contracts. Screen-based trading of bond futures, equity index futures and the euroyen and LIFFE euribor financed bond (EFB) futures was introduced in April and May; and money market futures were included during August and September. The exchange intends that all financial contracts

Merger of CGO and CMO with CREST

A consensus of market participants endorsed the recommendations set out in the Securities Settlement Priorities Review for the merger of the gilts, money markets and equity settlement systems within a single system. This was seen as essential to the establishment of the most efficient and effective securities settlement system, and to helping to consolidate London's position as one of the world's key financial centres.

Central Moneymarkets Office (CMO)

Responsibility for the operation of the CMO service was transferred to CRESTCo on 20 September 1999, although the depository function—required because money market instruments are in bearer paper form—continues to be operated by the Bank on behalf of CRESTCo. At the end of September the CMO database was transferred to the CRESTCo site.

Central Gilts Office (CGO)

Much progress has been made in preparing for the transfer of gilts settlement to CREST. The first phase in this process—the transfer of ownership and responsibility for the existing CGO service—took effect on 24 May 1999. The Bank will, however, continue to operate and support the CGO service on behalf of CRESTCo until the completion of phase 3—the migration of gilts settlement activity to CREST scheduled to take place on 1–2 July 2000.

In preparation for the implementation of phase 3, CRESTCo is undertaking comprehensive liaison to encourage members of both CREST and CGO to start the planning and preparations of their systems. This work has enabled CREST to address the small number of operational and technical differences between the CRESTCo and CGO services and to highlight the preparations that members of both CREST and CGO will need to make before migration can take effect. For

example, members will need to ensure that account structures in the two systems are identical and may also need to change their back-office systems to interface with CREST. There will be a period of trialling in the spring followed by two 'dress rehearsals' in June before the transfer of the gilts database to CRESTCo.

Legislative changes are also needed to facilitate the merger. Holdings and transfers of gilts in CGO are currently governed by the Stock Transfer Act 1982. Legislative changes will be needed to bring gilts under the Uncertificated Securities Regulations 1995 (USRs), made under Section 207 of the Companies Act 1989, which govern the holding and transfer of securities in CREST. These changes are currently being taken forward with HM Treasury and are expected to be put in place during the second quarter of 2000. The Treasury is also consulting on changes to the USRs, to include electronic transfer of title, to eliminate the short lag between settlement and registration.

Future developments

Once gilts have migrated to CREST, a number of further developments are planned. Work on the introduction of full delivery versus payment—the settlement of CREST transactions in real time against payment in central bank funds—is now under way. This is a joint development between the Bank and CREST for introduction before end-2001. The Bank issued a consultation document, *The future of money market instruments*, in November. The response indicated unanimous support for their dematerialisation and settlement in CREST. The next stage is to begin preparatory work, involving market participants, and to consider with HM Treasury the necessary secondary legislation. Integration into CREST would create a single unified securities settlement system in the United Kingdom. CRESTCo is also pursuing a series of other initiatives, including cross-border links with other European securities depositories.

will be transacted entirely electronically by the end of the first half of 2000.

The introduction of LIFFE *CONNECT*TM sparked a debate among LIFFE's members over whether money market futures were suited to screen trading; none of the global benchmark short-term interest rate (STIR) futures contracts had yet transferred to electronic trading. Some questioned whether any electronic system could be sufficiently sophisticated to replicate the complexities of floor trading; or indeed whether even 'vanilla' STIR products would migrate easily to screen, given the possible absence of liquidity provided by the locals.

LIFFE responded to such concerns in two ways. First, it introduced enhancements to enable LIFFE *CONNECT*TM to

accommodate a broad range of strategy trades, for example implied pricing and a trade-matching algorithm for STIR futures based on the pro-rata sharing of business. Second, in contrast to the transfer of bond and equity products to screen, where the floor was closed when LIFFE *CONNECT*TM was introduced, it operated parallel screen and pit trading for a period, to allow the market to determine its preferred method of trading. The euroSwiss contract migrated wholly to the screen within days. Short sterling and euribor contracts were slower to migrate; by 25 October, some two months after parallel trading began, LIFFE *CONNECT*TM accounted for a third of total short sterling volumes and around 60% of euribor volumes. On 25 October, LIFFE announced that, from 22 November, all of its STIR contracts would trade exclusively on LIFFE *CONNECT*TM. Following the

announcement, the remaining pit volume migrated quickly to screen.

The effect of the introduction of LIFFE *CONNECT*TM on trading volumes and patterns is difficult to identify. Though turnover in both short sterling and euribor contracts fell in the second half of 1999, it had begun to fall before the introduction of electronic trading, with other factors (reported in the section on turnover and liquidity) contributing to the decline. The system's impact on trading patterns and spreads, particularly in less liquid contracts, is not yet clear, though there is some evidence that more trades are now negotiated bilaterally or 'crossed internally' and subsequently executed on-screen. LIFFE has adapted its crossing rules to reflect the dynamics of

trading on LIFFE *CONNECT*TM, and introduced a block trading facility earlier in the year to support the evolving needs of its wholesale customers. By the end of 1999, LIFFE *CONNECT*TM had helped to cement LIFFE's dominance in euribor futures trading, and the Exchange's market share of euro-dominated STIR futures and options remains above 90%.

In August, LIFFE and the Chicago Mercantile Exchange (CME) announced a strategic partnership. The partnership, planned for early 2000, will have three key elements: cross-exchange electronic access; cross-clearing margin offsets for CME eurodollar and LIFFE euribor contracts; and the establishment of a 'for-profit' joint venture to develop new products and services.