

## Gilt-edged and sterling money markets: developments in 1997

*This article reviews developments in the gilt-edged and sterling money markets during 1997. There have been significant changes in these markets, as a result of both official and private sector initiatives and external developments.*

*The economic backdrop was propitious, with economic growth sustained in the United Kingdom for the fifth successive year, and inflation remaining low. Bond yields fell, by more in the United Kingdom than in many other countries. In Europe, the prospect of EMU came into sharper focus, with implications both for market yields and trading arrangements.*

*The Bank introduced reforms to its sterling money-market operations in March, widening the range of counterparties with whom the Bank would deal, and including gilt repo as a regular instrument in the Bank's open market operations. As a corollary, the Bank's counterparties in the gilt market, the gilt-edged market makers, were no longer required to be separately capitalised or specially supervised. Later in the year, the upgrading of the Central Gilts Office service at the Bank was completed, enabling the start of gilt strips trading. Looking ahead, work is under way to set up the UK Debt Management Office, which will assume responsibility for the Government's debt management from April 1998; changes to bring the sterling markets closer into line with the prospective euro markets are planned for 1998; and, following the introduction of index-linked auctions in the United States, HM Treasury is consulting the UK market about a similar initiative here.*

### Gilt and money-market yields in 1997

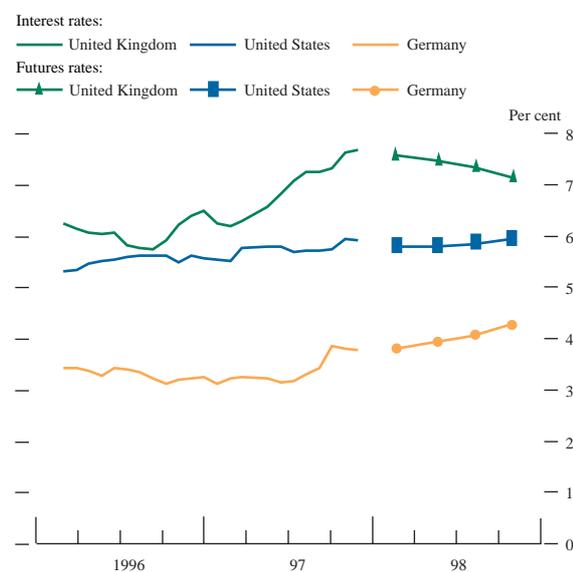
Short-term interest rates were increased five times in the United Kingdom in 1997. The rise in UK rates, 125 basis points, was greater than in any of the other Group of Seven (G7) industrialised countries, reflecting different cyclical positions.

Chart 1 shows the path of three-month interest rates in the United Kingdom, Germany and the United States. The increases in UK official rates widened the gap between UK rates and German and US rates during the year. The chart also shows expectations of short-term interest rates, derived from futures prices. At the beginning of 1997, markets expected three-month sterling Libor to peak at 7.9% at the end of 1999. In the event, three-month cash rates reached 7.7% towards the end of the year, pushed up partly by credit conditions in the interbank market. By the end of the year, however, three-month cash rates were expected to fall from their December high, to 7.6% by March 1998, and to 6.5% by the end of 1999.

Gilt yields fell in 1997. At 10 years, yields fell by around 120 basis points (see Chart 2); at 20 years, they fell by around 155 basis points. Bond yields fell by less in most other industrialised countries so that, in the year as a whole, the gap between UK and overseas bond yields narrowed.

Bond yields rose in the first quarter. The rise in US short-term interest rates in March affected global bond

**Chart 1**  
Three-month interest rates and futures rates<sup>(a)</sup>

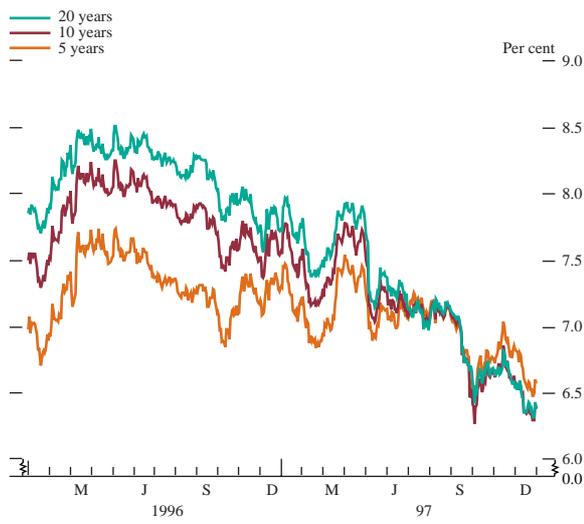


(a) Three-month Libor rates and rates implied by three-month futures contracts, traded on LIFFE and the Chicago Mercantile Exchange.

markets. And in the United Kingdom, strong labour market and retail sales data led markets to expect interest rates to rise soon after the May General Election.

For most of the rest of 1997, global bond markets rallied (as Chart 3 shows), helped by two factors. First, markets

**Chart 2**  
Par yields on British government stocks at 5, 10 and 20 years



appeared to put increasing weight on the view that global inflation pressures would remain low, largely because of continuing low inflation in the United States despite the strengthening labour market. Second, growing market confidence in EMU helped to stimulate convergence of European bond yields. The gap between Italian and German ten-year yields narrowed by about 145 basis points during the year, for example.

**Chart 3**  
International ten-year bond yields

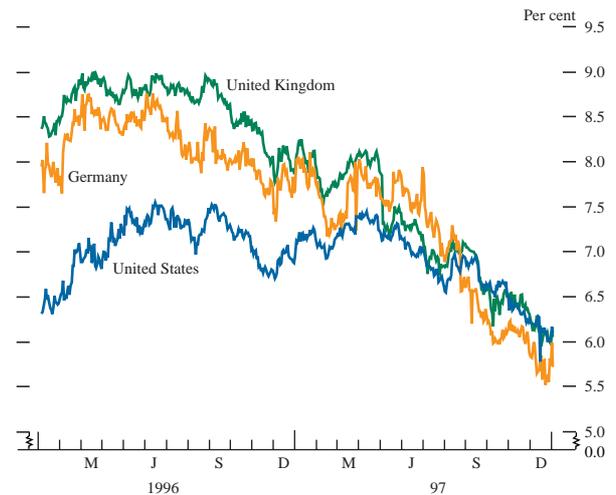


The gilt-edged market was also affected by three UK-specific factors:

- changes to the institutional monetary policy framework;
- the improving fiscal position; and
- the possibility of early UK entry into EMU.

On 6 May, the Government announced that the Bank would be given operational responsibility for setting interest rates to achieve the Government's inflation target, with

**Chart 4**  
Implied forward interest rates<sup>(a)</sup>



(a) Nominal six-month annualised interest rates, ten years forward, derived from the zero-coupon yield curve.

immediate effect. The gilt market rallied strongly on this news: ten-year yields fell by 29 basis points on the day. Inflation expectations, derived by comparing conventional with index-linked bond yields, fell by nearly half a percentage point ten years ahead, on the announcement of the Bank's operational independence. Over the year as a whole, inflation expectations fell more sharply at long maturities than at short: 15 years ahead they fell by 0.9 percentage points, and 3 years ahead by about 0.7 percentage points (see Chart 5).

**Chart 5**  
Implied forward inflation expectations<sup>(a)</sup>



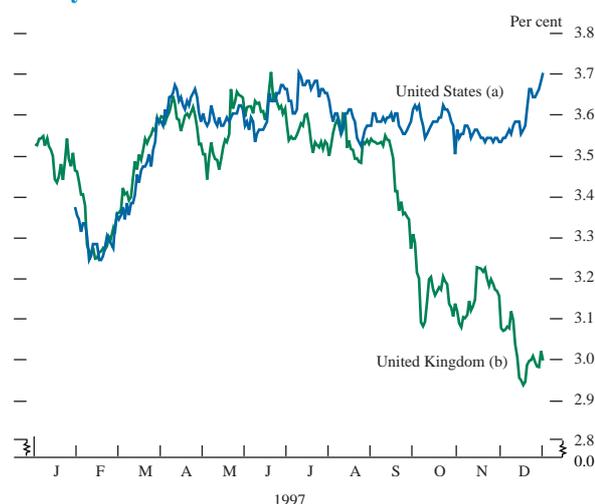
(a) Six-month annualised inflation rates, 3, 5 and 15 years forward, derived by comparing yields on conventional and index-linked bonds.

In the second half of the year, markets took the view that the Government's fiscal position in the current financial year and in future years was stronger than previously expected. This also contributed to the fall in gilt yields. The Budget on 2 July revised down the forecast CGBR for 1997/98 from £20 billion to £12.4 billion. The pre-Budget statement on 25 November revised that forecast down further to £11.7 billion.

During September, markets focused on the possibility of early UK entry into EMU, pushing gilt yields sharply lower at the short end of the yield curve.<sup>(1)</sup> During the fourth quarter, the gilt market (like other bond markets) was affected by the financial turbulence in Asia. At times, gilts were seen as a ‘safe haven’ and yields fell.

The index-linked gilt (IG) market was also affected by some of the above factors. The fall in inflation expectations following the announcement of the Bank’s independence tended to make IGs less attractive as an inflation hedge. During 1997, IG yields fell by around 45 basis points at twelve years, less than the fall in conventional yields at a similar maturity. A notable development during the year was the fall in UK real yields relative to those in the United States (see Chart 6). UK-specific factors may partly explain the divergence: in particular, the Minimum Funding Requirement, introduced in April, boosted demand for index-linked gilts from UK pension funds.<sup>(2)</sup>

**Chart 6**  
Real yields on index-linked bonds



(a) Real yields on 3<sup>3</sup>/<sub>8</sub>% inflation-indexed 2007.  
(b) Real yields on 2<sup>7</sup>/<sub>8</sub>% index-linked 2009.

## Developments in the sterling money markets

### Open market operations

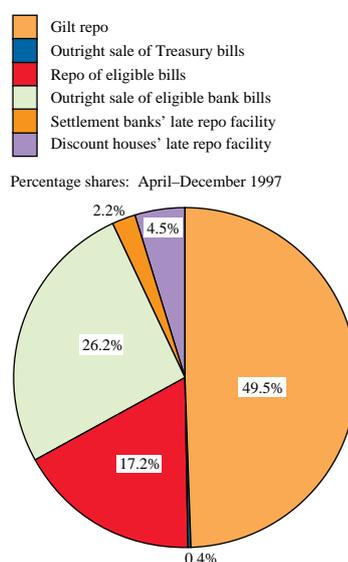
On 3 March 1997, the Bank introduced reforms to its sterling money-market operations. These reforms are described in detail in the May 1997 *Quarterly Bulletin*.<sup>(3)</sup> The two main elements of the reforms were the introduction of gilt repo as a regular instrument in the Bank’s open market operations (OMOs), increasing the pool of eligible collateral; and increasing the number and range of counterparties with whom the Bank was prepared to deal. The reforms had a number of objectives:

- to increase the efficiency with which the banking sector’s daily liquidity needs were met;

- to increase competition in the money market by making it more contestable (increasing the number of actual and potential counterparties);
- to relieve the strain on the bill market by increasing the pool of eligible collateral; and
- to continue to set very short-term interest rates, focusing on the two-week maturity.

During the first ten months of the new operations, about one half of the refinancing was provided by gilt repo, about one quarter by sales of bills outright, and about 17% by repo of eligible bills (see Chart 7).

**Chart 7**  
OMOs—instrument overview



### Sterling overnight interbank average rate (SONIA)

During the year, the market introduced a new measure of the shortest interest rate in the money market, the sterling overnight interbank average rate (SONIA). SONIA is a potentially useful tool to gauge short-term money-market conditions. Its derivative, the overnight indexed swap (OIS), provides a measure of expectations of official interest rates in the short term. SONIA is the average interest rate, weighted by volume of trade, on unsecured overnight interbank lending arranged by seven brokers in the London money market; it has been quoted since April 1997. SONIA is a better measure of the cost of borrowing money than, say, highs and lows taken from screens each day, because it is transactions-weighted: screen-quoted Libor rates are often merely indicative. Money markets in other countries, including France and Germany, have rates equivalent to SONIA. (See ‘Monetary operations’ in the August 1997 *Quarterly Bulletin*, pages 248–64 for further information.)

(1) See page 335 of the November 1997 *Quarterly Bulletin*.

(2) See box on page 341 of the November 1997 *Quarterly Bulletin*.

(3) See pages 204–7.

Overall, the reforms have proved successful. The stock of refinancing—the outstanding amount of refinancing that the Bank has provided to the market through OMOs—varied a little more in 1997 than in 1996. The higher variability in 1997 reflected the pattern of relatively even gilt financing, compared with the uneven profile of the CGBR and gilt redemptions—government spending is often bunched toward the end of the financial year; and this year, that effect was compounded by two large gilt redemptions in January 1998 and March 1998. As a result, the daily shortages tended to be larger and more variable: the shortages averaged £1.2 billion in 1997, compared with £0.9 billion in 1996, and their variability, measured by the coefficient of variation (standard deviation divided by mean), was 50% in 1997, compared with 43% in 1996.<sup>(1)</sup> The new system has coped well with these larger and more variable shortages.

The low stock of refinancing during August and September led the Bank to adapt its money-market operations. The redemption of £5½ billion of 8¾% Treasury Loan on 1 September 1997 meant that the Bank needed to drain additional liquidity from the money market during September. To cope with the expected fall in the stock of refinancing, the Bank issued one-month Treasury bills in addition to its regular tender of three-month bills. Issuing one-month bills allowed the Bank to target a particular month in which to drain liquidity. The Bank also adapted its daily money-market operations (to help deal with the particular day when the gilt matured)—adjusting the maturity of its repo operations and offering to buy in the maturing stock as part of its OMOs. (These operations are described in more detail in an article in the May 1997 *Quarterly Bulletin*, pages 204–7.)

### The gilt repo market

The gilt repo market is now two years old. It grew less quickly in 1997 than in 1996. After its early rapid growth, the repo market has matured into an important form of secured money at the short end of the sterling markets. Table A puts the gilt repo market in the context of other sterling money markets. By November 1997, the amount of gilt repo outstanding was £72 billion, compared with £100 billion for sterling certificates of deposit (CDs). (The CD market has continued to grow; favourable treatment of CDs within the sterling stock liquidity regime may be part of the reason for that. CDs have also frequently been used as collateral in stock lending transactions making gilts available to repo market players.)

The stock of eligible bank bills (bills that may be sold to the Bank as part of its daily operations) was broadly unchanged last year, at around £21 billion. So the introduction of gilt repo to the Bank's daily OMOs has been invaluable in dealing with this year's larger daily shortages.

A working party of the Stock Lending and Repo Committee (SLRC), under the chairmanship of the Bank, has been

**Table A**  
Sizes of sterling markets<sup>(a)</sup>

£ billions

		Commercial paper	Treasury bills	Eligible bills	CDs	Interbank (b)	Gilt repo	Gilt stock lending
1996	Feb.	7	12	22	77	110	37	5
	Nov.	7	5	23	89	124	68	16
1997	Feb.	8	4	22	94	119	71	14
	Nov.	8	3	21	100	135	72	24

(a) Outstanding amounts at the end of each month.  
(b) Sight and time deposits.

reviewing the Gilt Repo Code of Best Practice, the Code that guides conduct in the gilt repo market. The Code was established as part of the Bank's preparations for open gilt repo, and the SLRC has agreed to ensure that it remains up-to-date and continues to reflect best practice in the market. A revised version will be published shortly. Changes are expected to be relatively minor and technical, including a number of amendments that reflect the recent introduction of the upgraded Central Gilts Office (CGO) settlement system. The present conventions regarding substitutions and partial deliveries may also change.

## Developments in the gilt market

### The reform programme

Structural reforms in the gilt market continued in 1997. The principal developments during the year included the inauguration of the upgraded CGO service in November, and the start of the official gilt strips facility a month later; the lifting of the requirement for GEMMs to be separately capitalised; the announcement of prospective changes to the taxation of gilts; and consultation with the market on plans for changes in gilt market conventions. Meanwhile, the Government announced its intention to transfer responsibility for debt management from the Bank of England to a new Debt Management Office (see page 59).

### Strips

The official gilt strips facility was launched on 8 December 1997. The new facility enables gilt holders to exchange a coupon-bearing gilt for an equivalent series of zero-coupon payments (strips): one for each of the semi-annual coupon payments and one for the final principal payment. Conversely, those who wish to exchange an appropriate bundle of strips for a coupon-bearing gilt can make use of the reconstitution facility. Stripping and reconstitution are both available through gilt-edged market makers (GEMMs); strips are held in CGO in dematerialised form.

Strips provide a flexible new instrument, with many potential uses for investors and traders. They enable investors to match their cash flows more closely with their liabilities; bullish investors can take positions in long strips; and long-term savings institutions may be interested in the higher durations that strips provide.

(1) One reason why daily shortages were larger than in 1996 was that the twice-monthly gilt repo facility, used as an additional tool to smooth the money-market position, was withdrawn soon after the new money-market arrangements started in March. The new arrangements gave counterparties the choice of when to use gilts as OMO collateral.

## Establishment of the new Debt Management Office

On 6 May 1997, the Chancellor of the Exchequer announced, as part of his decision to give operational independence in setting interest rates to the Bank, that the Bank of England's role as the Government's agent for debt management, the sale of gilts, oversight of the gilts market and cash management would be transferred to the Treasury. The Treasury published a consultation document on 29 July ('The Future of UK Government Debt and Cash Management'), setting out the Government's initial proposals for the implementation of the Chancellor's decision by establishing a debt management body as an executive agency of the Treasury. A summary of the response to this consultation, together with an update on the Treasury's latest thinking on how the transfer of responsibilities will be implemented, was published on 22 December.

The agency, which will be called the Debt Management Office (DMO), will be formally established on 1 April 1998. As an Executive Agency, the DMO will not require legislation for its establishment. As now, Treasury ministers will set the annual Remit for the agency, published in the Debt Management Report each March. The Chief Executive will report regularly to Treasury ministers on the delivery of the Remit

requirements, and to agree any changes required to the Remit during the year. The precise relationship of the DMO to the Treasury will be set out in a published framework document.

The DMO will be responsible for implementing the annual gilt Remit for 1998/99. Hence, from April 1998, it will be responsible for decisions on auction stocks and sizes, taps of stock and any secondary market transactions within the terms of the Remit. The current intention is that the DMO's dealing capacity should be operational by 1 April 1998, but in the case of any delay, there may be a short period when the Bank continues to deal on the agency's behalf. The DMO will use the Bank's systems for settlement and registration.

There are no plans to change significantly the existing approach to debt management. The current policy of publishing an annual borrowing programme with a quarterly auction schedule, regular consultation meetings with market participants, and building up large benchmark issues will continue. Nor is it envisaged that there will be any significant change in the way in which the DMO will operate in the secondary market, compared with the Bank's current practice.

Traders can buy or sell strips for periods for which they have a view about interest rates; and by conducting similar transactions in strips in overseas bond markets, they may take or hedge a position on relative rates between the UK and those overseas markets at a precise period. Strips may therefore provide a useful source of information about these expectations.

The strips market has started quietly, as expected in its very early stages (see the box on pages 66–67 for more details). Around £82 billion of current outstanding stock is strippable, of which £873 million had been stripped as of 9 January. Market interest appears greatest at long maturities, but there has also been an interest in other maturity areas. For example, it has been suggested that short strips might be used to back retail products offering a guaranteed minimum return or, at the very short end, as a money-market instrument.

The authorities plan to review experience with strips trading during 1998 and may broaden the uses of strips in the light of the volatility and liquidity of the strips market. The Bank intends to make gilt strips eligible as collateral in its daily money-market operations and that, in due course, strips should be eligible for the purposes of RTGS facilities provided by the Bank to settlement members of the CHAPS Clearing Company Ltd. In addition, the Treasury is considering technical changes to facilitate stripping of index-linked gilts.

### *Launch of the upgraded CGO system*

The upgraded CGO system was successfully launched on 10 November 1997. The Bank announced in November 1995 that the CGO system was to be upgraded to facilitate handling of gilt repo and strips. The new system now incorporates CREST software, and other new software designed to provide users with greater flexibility. The key benefits of the new system include: (i) a stripping and reconstitution facility for gilts held in CGO; (ii) facilities for more efficient processing and settlement of repo transactions, which will allow back offices to settle a greater volume of trades; and (iii) forward-dated settlement. The upgraded CGO offers a wider range of facilities, providing the gilt market with a more sophisticated and flexible system through which to settle gilt transactions.<sup>(1)</sup>

### *End of separate capitalisation for GEMMs*

In March 1997, the Bank withdrew the requirement for GEMMs to be separately capitalised. This enabled GEMMs to assimilate their businesses into group-wide securities-trading operations to benefit from potentially lower regulatory capital requirements, and to integrate their systems, management and control structures more fully with those of the rest of the group. Most GEMMs took advantage of the ending of the requirement, with only five GEMMs (out of seventeen) remaining separately capitalised after December 1997.

(1) For more details, see the article on pages 70–78.

The Bank has also ceased specialist supervision of the GEMMs. From March 1997, there was a seven-month transition period during which GEMMs transferred either to the appropriate banking supervisor (the banking supervision department of the Bank of England or a European Economic Area banking supervisor) if the GEMM business merged with a bank, or to the Securities and Futures Authority if the GEMM business merged with a securities firm or remained separately capitalised. Supervision of GEMMs will be undertaken by the Financial Services Authority when it begins to operate, except where a GEMM has merged with a bank that is subject to supervision by an overseas EEA banking regulator. The Bank will of course continue to monitor developments in the gilt market: the Bank conducts open market operations in gilt repo; the Bank has a general interest in the safety and efficiency of sterling markets; and information about market conditions also contributes to the Bank's monetary policy analysis.

### *Changes to gilt taxation*

Legal provisions introduced as part of the July 1997 Budget will facilitate the receipt of gilt income in gross form. From 6 April 1998, all gilt holders will be able to receive income from their gilts in gross form, and special applications to the Inland Revenue for gross tax treatment will no longer be necessary. New holdings will automatically receive gross tax treatment (unless gilt holders indicate otherwise). Income from existing holdings will continue to be treated as now (unless gilt holders specify otherwise). Gilt holders can indicate to the Bank of England Registrar's Department which tax treatment they prefer.

In addition, as part of the reform of Corporation Tax, in November 1997 the Chancellor announced plans to abolish quarterly accounting for gilts from 1 April 1999. Under the new regime: (i) tax payments will apply one quarter in arrears; (ii) the new arrangements will not apply to small companies; (iii) changes will be phased in over four years (but current arrangements will disappear in April 1999); (iv) the new arrangements will also apply to equities and corporate debt. These provisions apply both to strips and strippable gilts in the same way.

### *Gilt market conventions*

In February 1997, the Bank issued a consultative paper on gilt market conventions. Three issues were raised for discussion: first, whether the daycount convention for the calculation of accrued interest should be changed from 'actual/365' to an alternative formula;<sup>(1)</sup> second, whether the convention of quoting gilt prices in fractions ( $1/32$ nds) should be changed to decimals; third, whether the ex-dividend period for gilts held in CGO should be abolished and the ex-dividend period for gilts held outside CGO reduced, and whether the special ex and special cum-dividend facilities should be amended or dropped.

In May 1997, the Bank announced the results of its consultation. In the light of market participants' responses, the Bank proposes to change to an 'actual/actual' convention for accrued interest calculations, and to the quotation of gilt prices in decimals. These changes will harmonise gilt market conventions with practices in European and other key bond markets (see the box on page 61) and were judged to be desirable whether or not the United Kingdom joins EMU. Implementation will take place by 1 January 1999.

A large majority of those responding to the consultation also favoured the abolition of the ex-dividend period for gilts held in CGO and the abolition of the special ex and special cum-dividend facilities. The launch of the upgraded CGO system was a pre-condition for such changes, though other systems amendments will also be necessary. A decision on possible changes to the ex-dividend period will be announced in 1998. If pursued, the implementation date would allow the market ample lead-time.

### *LIFFE contract changes*

In response to market demand and competition from other exchanges, LIFFE announced on 25 November that they would shortly be launching a new five-year gilt futures contract. The detail of the contract was announced on 27 January. The front delivery month for the new contract will be June 1998. The contract will be listed and traded from 26 February 1998; gilts with four to seven years' maturity will be deliverable in fulfilment of the contract; the contract will be quoted in decimals, rather than fractions; and it will have a nominal value of £100,000.

The decision to launch the five-year contract in decimals ahead of the introduction of decimalisation in the cash market was taken as a result of feedback from LIFFE members, who expressed a desire to see the contract listed in decimals from the outset. (The Bank is planning to introduce decimalisation by 1 January 1999—see 'Market conventions' above). The quotation in decimals prompted LIFFE to set the nominal size of the contract at £100,000, thereby implying a tick size (the minimum unit of price movement) of £10. LIFFE members unanimously agreed that a contract size of £50,000 listed in decimals would have too small a tick size (£5).

The notional coupon on the five-year contract will be 7%. The notional coupon is key to the calculation of the price factor—the formula by which different bonds are equated to the futures contract for the purpose of delivery. When actual yields remain below the notional coupon, as has been the case with the long gilt future throughout 1997, the price factor system introduces a bias that encourages delivery of the high-coupon bonds.

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

## Sterling markets and EMU

Following the Chancellor of the Exchequer's statement to the House of Commons on 27 October, confirming that the United Kingdom would not seek membership of the single currency at its start on 1 January 1999, it is clear that sterling markets will remain in being for some time after the introduction of the euro. But market participants will also have to proceed with preparations for conversion from sterling to the euro, following possible later UK entry into EMU.

### *Sterling markets following the introduction of the euro*

The structure of the sterling money and bond markets will remain largely unchanged after the move of other countries to the third stage of EMU in 1999. The Bank of England has no plans to alter its operations in the sterling money markets because of the introduction of the euro. Likewise, the UK government will continue to issue gilts in sterling. Of course, the markets themselves will be affected by the existence of a very large neighbouring capital market. Gilt yields are likely to be influenced by movements in the euro yield curve. Traders already look closely at the yield differential between gilts and German government bonds. This type of trading behaviour is likely to increase after EMU begins, and as sterling and euro yields converge in line with expectations of UK entry into EMU.

The main wholesale market associations have agreed recommended market conventions for the euro, as set out in the table below. These were announced on 9 July and endorsed by the EMI Council in September. Sterling

markets will not necessarily adopt these conventions. For example, the basis on which interest is calculated in the sterling money markets will continue to be the actual number of days from value to maturity divided by 365, as opposed to 360; and business days for sterling transactions will exclude UK bank holidays. But two changes to gilt market conventions are planned, and both are in the direction of harmonisation with the new euro standards. First, gilt prices will be quoted in decimals (£0.01 per £100 nominal) rather than fractions (£ $\frac{1}{32}$ nds per £100 nominal). Second, accrued interest in the gilt market will be calculated on the basis of an 'actual/actual' daycount, rather than the current convention of 'actual/365'.<sup>(1)</sup> These changes will be implemented by 1 January 1999, and follow full consultation with gilt market participants.

### *Recommended market conventions for the euro*

#### Euro money markets

- Daycount basis: actual/360
- Settlement basis: spot (two-day) standard
- Fixing period for derivatives contracts: two-day rate fixing convention
- Business days: TARGET operating days should form the basis for euro business days

#### Euro bond markets

- Daycount basis: actual/actual
- Quotation basis: decimals rather than fractions
- Business days: TARGET operating days should form the basis for euro business days
- Coupon frequency: no standardised practice is recommended
- Settlement dates: the standard for internationally traded cross-border transactions for the euro should remain on a T+3 business day cycle

#### Euro foreign exchange markets

- Settlement timing: spot convention, with interest accrual beginning on the second day after the deal has been struck
- Quotation: 'certain for uncertain' (ie 1 euro = x foreign currency units)
- Reference rate: the ECB (or national central banks) should be responsible for the publication of daily closing reference rates

(1) In practice, this means the accrued interest payable on a transaction is calculated as the semi-annual coupon multiplied by the number of days since the last coupon date, divided by the number of days in the coupon period. Currently, the denominator is always 182.5 (ie 365/2).

The specification of the existing March 1998 long gilt contract differs from the new five-year contract: it is quoted in fractions ( $\frac{1}{32}$ nds), and it has a 9% notional coupon and a nominal value of £50,000. In order to bring the short and long gilt contracts into line, LIFFE listed the June 1998 long gilt contract on 1 December 1997 with a reduced notional coupon of 7%. LIFFE subsequently announced, on 17 December, that the June 1998 long contract would switch from fractions to decimals with effect from the beginning of May 1998, resulting in a tick size of £5 until the contract's expiry (since the nominal value of the contract will remain unchanged at £50,000). The listing of the September 1998 long gilt contract has been deferred to the end of February, to enable the contract specification to incorporate decimals from the start; this contract will have a nominal value of £100,000, and hence a tick size of £10.

### *Extension of the LIFFE basis-trading facility*

A basis trade involves the simultaneous exchange of a cash bond and an appropriate offsetting number of futures contracts, in a privately negotiated transaction between two

parties, organised outside the trading pit. The cash and futures legs of the basis trade are negotiated simultaneously, but are executed separately. LIFFE's basis-trading facility (BTF) permits the futures leg of eligible basis trades to be transacted at a dedicated post and without price execution risk.

LIFFE's BTF has been available for the transaction of futures legs of basis trades involving deliverable (ie belonging to the deliverable basket of the relevant futures contract) cash government bonds since July 1995—initially for German bunds and later extended to Italian BTPs and UK gilts. Such 'deliverable basis trades' make use of the price factor. The price factor is the price of an individual cash bond such that its yield to maturity on the delivery day of the relevant futures contract is equal to the notional coupon of the futures contract (and then divided by 100). The price factor maps the futures price onto the price scale of the deliverable cash bond: the product of the price factor and the futures price is the forward price available in the futures market for that cash bond. The price factor is used in deliverable basis trades to establish the price relationship between, and the

## Consultation on index-linked auctions

The 1997/98 Debt Management Report (published in March 1997) stated that the UK authorities saw positive merit in moving to an index-linked gilts (IGs) auction programme as soon as was feasible. This was subject to: first, reviewing the impact of the early US experience in auctioning inflation-indexed government securities; and second, conducting a further round of consultation with the market. In the consultation document 'The Future of UK Debt and Cash Management' (July 1997), the new Government confirmed that it intended to proceed with this consultation, with a view to introducing auctions for IGs in due course.

### US experience of auctioning index-linked debt

The US Treasury conducted four auctions of its new inflation-indexed securities in 1997 and another in January 1998. Summary statistics from these uniform-price auctions appear in the table. To date a total of \$39 billion of five-year and ten-year Treasury inflation-indexed securities (TIIS) has been issued.

#### Summary of US Treasury inflation-indexed security auctions

Auction date	Maturity date (per cent)	Clearing yield (per cent)	Median yield (per cent)	Lowest yield bid (per cent)	Bid/cover ratio
1997 Jan.	Jan. 2007	3.449	3.400	3.200	5.31
Apr.	Jan. 2007	3.650	3.590	3.450	2.26
July	July 2002	3.744	3.668	3.550	3.31
Oct.	July 2002	3.600	3.580	3.499	3.56
1998 Jan.	Jan. 2008	3.730	3.699	3.580	2.94

The design of these inflation-indexed securities and the outcome of the first two auctions were examined in greater detail in the May 1997 *Quarterly Bulletin*. The US Treasury is currently engaged in a consultation exercise with the market on possible minor changes to the terms of trading TIIS in order to ensure fungibility between coupon strips from different indexed securities, and it plans to have established, by the end of 1998, a regular calendar for issuing new 5, 10 and 30-year TIIS.

### Consultation document

Following the early US experience with TIIS auctions, the Treasury published on 5 January 1998 a consultation document on the introduction of IG auctions in the United Kingdom.<sup>(1)</sup> Responses were invited from GEMMs, end-investors and other interested parties.

The consultation document concentrated on four sets of issues:

#### (i) Structure of IG auctions

Views were invited on the size, frequency, and annual calendar of any IG auctions. In addition, comments were invited on the possible format of the auctions, including whether the type of bidding should be uniform or bid-price. (In a uniform-price auction, all successful bidders pay the clearing price, irrespective of their individual bids; in a bid-price auction, successful bidders pay what they bid.)

#### (ii) Issuance policy

Views were invited on whether IGs should be issued solely through auctions, or whether issuance through taps should continue between auctions. The presumption is that there would be no issuance (or buying in) in the two weeks before an auction, nor in the period immediately after the auction, at or near the auction price.

#### (iii) Market structure and index-linked gilts

In December 1995, the Bank of England conducted a consultation exercise on the advantages and disadvantages of establishing a separate list of IG market makers. At that time, market views were divided. The question has been reopened in the current consultation round, along with the issue of obligations and privileges that should attach to membership of such a list, including access to auctions.

#### (iv) IG redesign

Views were invited on the value that market participants would attach to a redesign of IGs—were the authorities to consider this—to bring them into line with the US/Canadian model (the main features of which include a three-month time lag in applying the inflation uplift, strippability, and benchmark issuance).

The consultation document asked for views on how IG coupon strips could be made fungible, and suggested that in order to achieve this, the nominal coupons on the bonds in question would have to be equal—equivalently, the bonds would need to have aligned coupon dates, the same base RPI value and the same real coupon.

(1) Copies can be obtained from Ms N Trebble, HM Treasury, Debt and Reserves Management Team, 2nd Floor, Treasury Chambers, Parliament Street, London, SW1P 3AG.

relative amounts of, the cash and futures leg (the ‘gross basis’ and ‘hedge ratio’, respectively).

From 23 February, LIFFE will permit the futures legs of basis trades involving a range of cash bonds outside the futures leg’s deliverable basket to be transacted via the BTF. In the absence of price factors for such ‘non-deliverable basis trades’ (price factors only exist for deliverable cash bonds), the hedge ratio is established using the sensitivities of the cash bond and the futures contract to changes in yield (the price sensitivity of an instrument to changes in yield is quantified as the ‘basis point value’ or BPV). The resulting hedge ratio is known as the BPV or ‘modified duration’ hedge ratio. For example, if the price of a bond moved 7 basis points in response to a 1 basis point change in yield, its BPV would be 7. The BPV of a bond futures contract is the ratio of the BPV of the cheapest to deliver (‘CTD’) bond to the price factor of the CTD (the CTD bond in the deliverable basket that is, given prevailing market conditions, the most economically rewarding deliverable bond for the seller of the futures contract to select to deliver into the contract at delivery). The ratio of the BPV of the cash bond to the BPV of the futures contract (all then multiplied by the nominal amount of the cash bond and divided by the notional amount of one bond futures contract) gives the number of bond futures contracts required in the BPV hedge ratio.

### Operational Notice

In July 1997, the Bank issued a revised version of the Operational Notice, first published in June 1996, setting out the objectives and procedures for the Bank’s operations in the gilt-edged market, acting as the Government’s debt manager. The notice describes the arrangements for the primary and secondary market operations that the Bank undertakes. It covers auctions, tap sales, sales from official portfolios and other secondary market operations.

The changes from the previous notice were largely technical, covering in particular the change in the timing of gilt auctions introduced in March (with bidding closing thirty minutes later, at 10.30 am).

### Gilt sales requirement

The gilt sales requirement is set at the start of each financial year in the Remit given to the Bank as the Government’s debt manager. (The box on page 59 discusses the impending transfer of responsibility for debt management.) The sales requirement may be revised during the year as the Government’s financial requirements change. Gilt sales in the first calendar quarter of 1997 (the final quarter of the financial year 1996/97) totalled £9.7 billion, bringing the total for the financial year to £38.8 billion. Mainly as a result of a lower CGBR outturn than forecast, overshooting of the gilt sales target of £3.9 billion was carried forward into the following financial year.

The gilt sales target for 1997/98 was originally set at £36.5 billion in the annual *Debt Management Report*

published on 12 March 1997, based on a CGBR forecast of £20.0 billion and expected gilt redemptions during the year of £19.6 billion. This target was subsequently revised down by £3.9 billion when the carry-over of excess gilt sales from the previous year was confirmed. Following the Budget in July, the CGBR forecast was reduced from £20.0 billion to £12.4 billion and the gilt sales requirement fell to £25.1 billion. In the November pre-Budget Statement, the CGBR forecast was again revised downwards to £11.7 billion, but the reduction in the expected contribution from National Savings, from £3 billion to £2 billion, meant that the gilt sales requirement increased slightly from £25.1 billion to £25.4 billion. By the end of December, three quarters of the way through the financial year, more than 80% of this target had been met.

### Stocks issued

Gross gilt sales during 1997 were £30.7 billion, of which £20.9 billion was in the first nine months of the current financial year. Sales of index-linked gilts raised £4.9 billion. Index-linked sales in the 1996/97 financial year as a whole accounted for 15% of total gilt sales, precisely in line with the target in the Remit from the Government to the Bank. The target for index-linked sales for 1997/98 was increased to 20% of total gilt sales, reflecting the authorities’ assessment that index-linked gilts continue to have cost and risk advantages for the Government, and expectations of increased demand for index-linked gilts following the introduction of the Minimum Funding Requirement under the Pensions Act in April.

The aim of approximately one third of conventional stock issuance in each maturity band (shorts 3–7 years, mediums 7–15 years, longs 15 years and over) was broadly achieved in 1996/97, with conventional funding distributed in the proportion of 34%, 31.5% and 34.5% across shorts, mediums and longs respectively. The target issuance pattern in the 1997/98 remit was changed slightly, skewed towards the short and long ends, with the targets for shorts, mediums and longs set at 35%:30%:35%. This revised distribution took into account the pattern of refinancing in the short term, while being broadly consistent with a stable portfolio mix in the longer term. It also reflected the greater likelihood of demand for gilt strips in the short and long maturity areas, and the stock maturities that fit more readily into the dual auction format (four of which were originally planned for 1997/98—see below).

Eleven of the auction sales during the year sold existing stocks, and two created new stocks. The first of the new stocks, issued in January, was the new ten-year benchmark (7¼% Treasury 2007), which was reopened three times during the year. The second new stock, issued in December, was a new five-year benchmark maturing in December 2003 (6½% Treasury 2003). The initial six-year maturity was intended to allow the authorities sufficient opportunity to build up liquidity in the stock in the light of the lower gilt financing requirement forecast for the next two years. There was no issuance of floating-rate stocks during 1997.

All of the £25 billion nominal conventional stocks issued during the calendar year were strippable (following the opening of the official gilt strips facility on 8 December 1997). It had been intended to build up the pool of strippable stocks further by making conversion offers during the year. In the event, however, this was prevented by the systems changes associated with the introduction of the upgraded CGO service, but the authorities reiterated their intention to make further offers in the 1998/99 financial year.

## Methods of stock issuance

### Auctions

Issuance of stock by auction accounted for all conventional sales in 1997, in line with the policy that auctions should constitute the primary means of conventional gilt sales. The frequency of auctions was slightly reduced in 1997, with auctions occurring in ten months of the year, compared with eleven in 1996. This reflected the cancellation of the auction originally scheduled for August, as a result of the reduction in the gilt financing requirement for the 1997/98 financial year announced after the July Budget (the auction scheduled for February 1998 was also cancelled). There were three dual auctions (auctions of two separate stocks held in close succession) in 1997, following their successful introduction in 1996, when two were held. Four dual auctions were originally scheduled to take place in 1997, but one of these was changed (together with that scheduled for the final quarter of 1997/98) to a single auction following the July Budget.

Table B details the auctions held in 1997. The average size of single auctions during the year was £2.1 billion (compared with £2.9 billion in 1996), and for each leg of the dual auctions the average size was £1.67 billion (compared with £1.75 billion in 1996).

Auction cover (the ratio of bids to stock on offer) was very slightly higher on average in 1997 than 1996, while yield tails (the yield difference between the average and lowest accepted price) were on average markedly lower. Higher cover at auctions in 1997 reflects greater bidding by the GEMMs for their own account (see Table C) as a proportion of the available stock. This appears related to the fact that auction sizes generally became smaller in 1997. There tends to be a negative correlation (albeit weak, with  $r$ -squared = 0.3) between the size of an auction and the amount GEMMs bid for (on a competitive own-account basis), which is related to the 'warehousing' role that GEMMs perform for clients. If the level of inventory risk exposure that GEMMs are prepared to face remains the same at each auction, then bidding would remain constant over time. When auctions become smaller, one would expect to see GEMMs' bidding increase, relative to the stock on offer, and this is what has happened during the last year. Allotments have also become less concentrated among the GEMMs, with more GEMMs being allotted more stock on a competitive basis than a year ago. This is also likely to have encouraged GEMMs' bidding.

**Table B**  
Auction results

Stock title	Status	Amount of issue (£ billions)	Date of auction 1997	Average yield per cent	Times covered (a)	Tail (b) (basis points)
7 <sup>1</sup> / <sub>4</sub> % 2007	New Strippable	2.5	28 Jan.	7.57	2.17	1
7% 2002	Fungible Strippable	1.5	30 Jan.	7.13	3.82	0
8% 2021	Fungible Strippable	2.5	26 Feb.	7.38	1.93	1
7 <sup>1</sup> / <sub>4</sub> % 2007	Fungible Strippable	2.5	26 Mar.	7.64	3.09	1
7% 2002	Fungible Strippable	2.0	23 Apr.	7.24	3.49	1
7% 2002	Fungible Strippable	1.5	20 May	6.94	3.03	0
8% 2021	Fungible Strippable	1.5	22 May	7.24	1.29	4
7 <sup>1</sup> / <sub>4</sub> % 2007	Fungible Strippable	2.0	25 June	7.13	2.71	1
8% 2021	Fungible Strippable	2.0	23 July	6.86	2.32	1
7% 2002	Fungible Strippable	1.5	23 Sept.	6.71	2.30	1
8% 2021	Fungible Strippable	1.5	25 Sept.	6.57	2.33	1
7 <sup>1</sup> / <sub>4</sub> % 2007	Fungible Strippable	2.0	29 Oct.	6.66	2.39	1
6 <sup>1</sup> / <sub>2</sub> % 2003	New Strippable	2.0	10 Dec.	6.53	1.77	2

### Average outcomes

	1996 (c)	1997
Cover	2.48	2.51
Tail	1.83	1.16

- (a) The ratio of bids to stock on offer.  
 (b) The yield difference between the average and lowest accepted price.  
 (c) Excluding floating-rate gilt auction.

**Table C**  
Auction participation<sup>(a)</sup>

	1996	1997
GEMMs' own-account competitive bids	175	202
Customer competitive bids	71	47
GEMMs' cumulative shorting of positions covering the when-issued week, up to the evening before the auction	19	27
GEMMs' cumulative shorting during the when-issued week, including morning of auction	33	38

- (a) Average for all auctions (as a percentage of the stock on offer). The figures are not weighted by the size of auction.

Client bidding also appears to have been affected by the smaller size of auctions. Clients of the GEMMs bid for about one quarter less in 1997 than in 1996 (as a percentage of the stock on offer). Smaller auctions have been associated with lower yield tails, which may reduce the attractiveness of bidding to clients, as lower-priced bids are less likely to be successful at smaller auctions. And anecdotal evidence suggests that smaller auctions tend to attract less publicity than larger ones and are therefore not as well bid by investors. Instead, clients have increasingly purchased stock during the 'when-issued' period before an auction, which is often seen as a substitute to bidding at the auction itself. Such purchases now tend to be made later on in the 'when-issued' period than has historically been the case, though clients have tended to buy less stock on the morning of the auction than they did in 1996.

### Index-linked gilts

Index-linked gilts continued to be issued through the tap mechanism. The Treasury's *Debt Management Report 1997/98* stated that the UK authorities saw positive merit in moving to an index-linked gilt auction programme and intended to do so as soon as was feasible. But it was felt beneficial to observe further experience of the US Treasury inflation-indexed (TII) note auction programme and undertake further consultation on the format, timing and size of UK auctions before proceeding (see the box on page 62 on consultation on index-linked auctions).

The Minimum Funding Requirement contained in the Pensions Act, which came into force on 7 April 1997, is expected to lead to greater demand for index-linked bonds as a close match for some pension liabilities. The development of inflation-indexed bonds in the United States and elsewhere has also generated international interest. In anticipation of this increased demand, and bearing in mind the cost and risk advantages of such issuance to the Government, it was decided to increase the target for index-linked sales from 15% to 20% of total issuance for the 1997/98 financial year. This initially implied an index-linked sales target of £7.3 billion. This was reduced to £5.0 billion following the revised CGBR forecast in the July Budget, and then increased slightly to £5.1 billion following the Chancellor's November Pre-Budget Statement and the reduction in the expected contribution from National Savings. The reduced sales requirement contributed to the strong performance of the sector in the second half of the year.

A monthly average of £402 million of cash tap sales of index-linked gilts was made during 1997. In addition to the factors mentioned above, sales during 1997 were bolstered by institutional switching out of equities both in anticipation of, and following the removal of, pension funds' tax credit on dividends in the July Budget (which made equities less attractive relative to bonds), as well as the increased volatility in UK and other equity markets stemming from the turbulence in Asia.

There were eleven index-linked tap packages issued in 1997, of which eight comprised two stocks and three were for single stocks. The size of the packages varied between £150–400 million in nominal terms (or between £250–650 million by value). Issuance was particularly concentrated in the June–September period, in response to institutional demand before and after the July Budget. Demand was more subdued in April and May because of the increase in the index-linked sales target announced in March; the reduction in inflation expectations, and hence the attractions of index-linked stock following the changes to the institutional monetary policy framework announced on 6 May; and a US TII auction on 8 April that disappointed some market participants. The pace of issuance slowed again in the final quarter, in part reflecting the lower sales target.

### Conventional taps

Taps of conventional stocks are used for market-management purposes, when there is temporary excess demand in a particular stock or sector. Conventional tap sales are becoming increasingly rare. In the financial year 1996/97, they amounted to only 1.5% of total issuance, well below the indicative ceiling of 10% of total issuance. There were no conventional taps in 1997.

### Secondary market sales

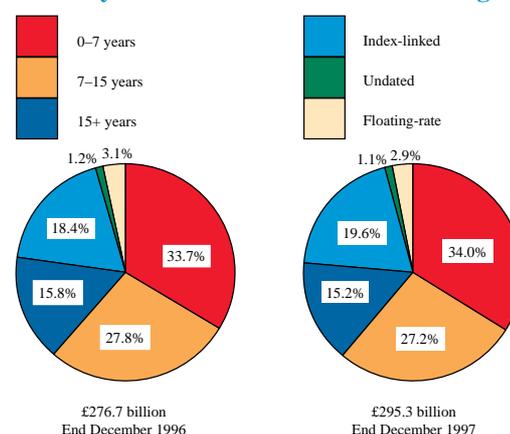
Net secondary market sales constituted only 1.3% of total gilt sales in 1997, consistent with the authorities' policy of concentrating sales in conventional auctions and index-linked tap sales.

The amount of stock available through the Bank's 'shop window' was boosted in the first half of 1997 by some sales of stocks by public funds managed by the Commissioners for the Reduction of the National Debt. This encouraged wider participation among the GEMMs and facilitated much greater switching activity, enhancing the liquidity of the market. Monthly switching turnover in the first half of the year averaged more than £590 million nominal, with turnover in February alone reaching £960 million. Outright sales from the shop window were made in response to GEMMs' bids during the strong market rally between May and September. There were no stocks in the shop window by the end of September, and monthly turnover of stocks in the shop window during the second half of 1997 was much lower, averaging just £92 million.

### Stock outstanding

Chart 8 shows the breakdown of stock outstanding (in nominal terms, including the inflation uplift on index-linked gilts) at end 1996 and end 1997. Total gilts outstanding rose from £277 billion to £295 billion. Changes in the portfolio shares of different maturities reflect the effect of new issuance, redemptions and ageing. In 1997, the proportion of shorts:mediums:longs within conventionals changed very little, from 46:35:19 in 1996 to 45:35:20 in 1997. The percentage of index-linked gilts in the portfolio

**Chart 8**  
Maturity breakdown of stock outstanding<sup>(a)</sup>



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

## The start of the strips market

Since the launch of the gilt stripping facility on 8 December, strip market activity has been modest. This has allowed the market to develop liquidity gradually, as dealers and other market participants develop their systems and analytical capabilities without taking large risk exposures close to the year end. Experience has shown that the stripping and reconstituting mechanisms in CGO both work as intended. During the first month:

- GEMMS' turnover with their clients was roughly 2.3% of the average turnover in conventionals and index-linked gilts during the same period, representing a quiet but positive start;
- GEMMS were mainly taking positions in principal strips, mostly at the medium to long end. Between GEMMS, the trading activity appears mostly to be between principal strips and the matching coupon gilt;
- clients' interest has been both in principal and coupon strips. They have bought strips across the yield curve, with somewhat more trading in short and medium strips (perhaps because of the larger number and nominal value of strips at the shorter end);
- turnover in short and medium strips has been about equal, though a relatively higher interest in shorts might have been expected. The interest in mediums may reflect the fact that some medium strips have a similar duration to longer coupon-bearing gilts. This enables an investor to take a view by switching between coupon-bearing and zero coupon gilts, while keeping duration at the same level.

### Stock outstanding

Stripping facilities already exist in the United States, Canada and France, among other countries; they were

recently introduced in Germany and the United Kingdom, and will soon be introduced in Spain. The data below indicate that the most active strips markets are (i) relatively mature and (ii) provide large nominal outstanding values of strippable stock—notably the United States and France.

### US, German, French, and UK strips markets<sup>(a)</sup>

	Date of start	Number of strippable stocks	Total strippable stock outstanding (billions)	Percentage stripped (by nominal value)
United States	February 1985	58	\$1,150 (£701) (b)	20.2%
Germany	July 1997	4	DM 102 (£34)	7.56%
France	May 1991	22 9	FFr 1,229 (£124) ECU 20 (£16)	15.3% 3.95%
United Kingdom	December 1997	8	£82	1.1%

(a) Federal Government stocks only. US data are as of 7 January 1998. German data are as of 30 December 1997. French data are as of 30 December 1997. UK data are as of 9 January 1998.

(b) Exchange rates as at 2 January 1998.

### Gilt strip pricing and zero-coupon curves

So far, strips are a small part of the gilt market, and strips prices may largely have been derived from those of coupon bonds. Strips prices can be derived using a model of the yield curve, but market practitioners have different models, and this has been reflected in the strips prices they have quoted. As trading builds up, arbitrage may bring prices quoted by different GEMMS closer together.

There is some evidence that convergence has been taking place. Each day, the GEMMS provide prices for gilts and gilt strips to the Bank of England, from which the Bank calculates reference prices on behalf of the Gilt-Edged Market Makers' Association (GEMMA). The standard deviation of the yields calculated from the prices quoted by each GEMM on the December 2007 coupon strip fell only slightly from 0.041 on 28 November to 0.040 on 9 January, but for the December 2017 coupon strip the corresponding fall was from 0.052 to 0.020. The prices

**Table D**  
**Strippable stocks outstanding (at end December 1997)**

Stock title	Nominal amount in issue (£ millions)
8% Treasury Stock 2000	9,800
7% Treasury Stock 2002	9,000
6½% Treasury Stock 2003	2,000
8½% Treasury Stock 2005	10,373
7½% Treasury Stock 2006	11,700
7½% Treasury Stock 2007	9,000
8% Treasury Stock 2015	13,787
8% Treasury Stock 2021	16,500

increased from 18.4% to 19.6%. Table D shows the amounts outstanding in each of the eight strippable stock at end 1997. The total nominal outstanding of the stocks amounted to 35% of total conventional stocks in issue.

### Turnover in the gilt market

Customer turnover in gilts with the GEMMS (in value terms and excluding repo transactions) was on a rising

trend through 1997 (see Chart 9). Average total weekly turnover was £24 billion in 1997, compared with £21 billion in 1996. Chart 9 shows that activity was highest in February, May and September, when the market rose. Turnover was also highest in those weeks when the Bank held an auction of gilts. On average, retail turnover in gilts was 12% higher in auction weeks compared with non-auction weeks in 1997. Interest in the auction stocks helps to stimulate activity in other stocks, eg through switching between bonds of a similar maturity. It may also reflect a perception that liquidity improves in auction weeks, thereby encouraging potential buyers and sellers of gilts into the market around times of an auction. Meanwhile, actual changes in short-term interest rates during 1997, as well as expected interest rate changes, probably contributed to an increase in overall gilts turnover. The rise in the amount outstanding in the gilt repo

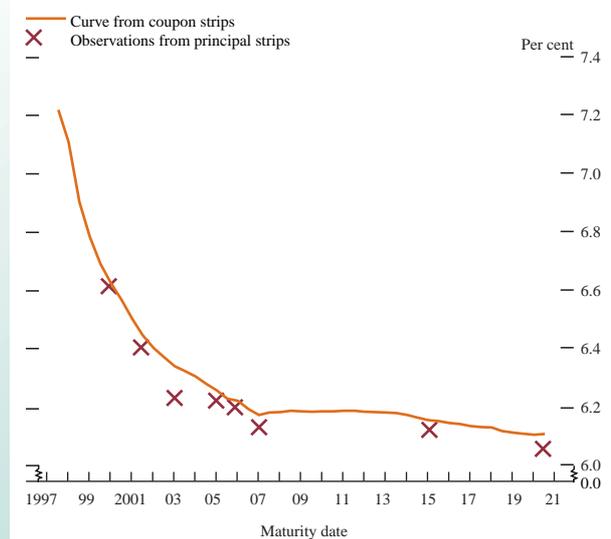
submitted on 28 November were ‘trailing’ prices before trading had started, and probably reflect the different term structure models used to value strips in the early stages of the market.

Factors that may explain why spot yields quoted on strips differ from spot yields derived from coupon-bearing gilts, other than yield curve model variations, include the following:

- Strip yields are likely to reflect liquidity considerations. Other things being equal, short coupon strips may be more liquid than longer-dated coupon strips (since there is a larger volume of short-dated strips outstanding, because of their accumulation from each of the individual strippable gilts); similarly, individual strips are likely to be less liquid than benchmark coupon gilts of the same maturity;
- ‘segmentation effects’ in the term structure of actual spot rates may occur, because demand is concentrated at particular points on the yield curve. For example, demand for short strips by financial institutions seeking assets with low credit and interest rate risk, and demand for long strips by pension funds seeking to match their long term liabilities, is likely to depress yields on short and long strips.<sup>(1)</sup> The main reasons why these demand effects may not have been eliminated by arbitrage are the relative lack of liquidity in this new market, and the risks and costs involved in taking short or long positions;
- since the principal strips have much greater amounts outstanding than the coupon strips of the same maturity (and hence are potentially more liquid) they will tend to trade at a lower yield. Early evidence suggests that this ‘principal strip premium’ is worth

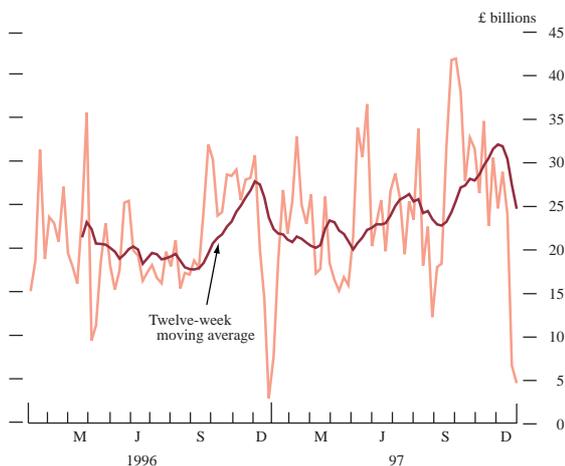
0.5–3.0 basis points in yield terms, depending on maturity. But the coupon/principal yield difference can be well outside this range at any specific maturity. This is because the principal strip required for reconstituting a gilt is unique and cannot be constructed from coupon strips, and so any supply or demand influences on the underlying gilt (for example, status as a benchmark) will also affect the yield on the principal strip, and *vice versa*. For example, the December 2003 coupon/principal strip difference was around 10 basis points on 29 December 1997, reflecting the small amount outstanding of the new 6½% Treasury Stock 2003 issue. The chart illustrates the yield level differences between coupon and principal strips, as well as the large maturity gaps between the principal strips (which complicate the direct estimation of a complete zero-coupon curve from the principal strips).<sup>(2)</sup>

UK nominal interest rate spot curves (using strips prices) on 29 December 1997



(1) These effects may not occur to the same degree as with coupon-bearing gilts. For example, for a given maturity, strips provide higher durations than coupon-bearing gilts, and so for duration-matching reasons, strip spot yields at the long end are likely to be depressed relative to spot yields derived from coupon-bearing gilts.  
 (2) This chart uses the average of the reference prices quoted by the market makers, as calculated by the Bank of England.

Chart 9  
GEMM customer turnover



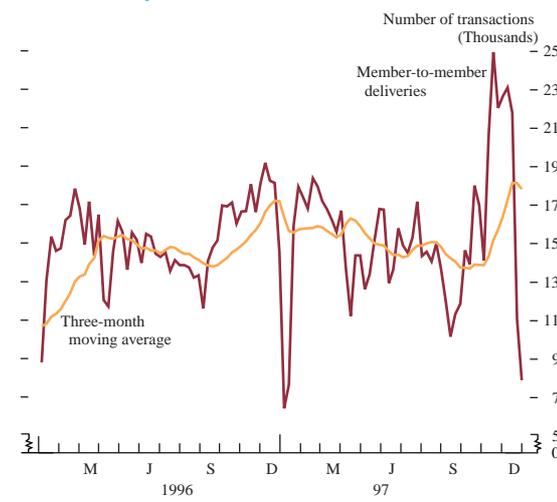
market will also have contributed to greater cash market activity.

Activity increased most in 1997 for those gilts with a very short maturity (one year or less), where the value of turnover rose by two thirds. The value of gilts outstanding in the under one year maturity range increased by less than 2% last year, partly because there were some substantial redemptions. For example, £3.7 billion of 10½% Exchequer Stock 1997 matured in February, and £5.5 billion of 8¾% Treasury Loan 1997 was redeemed in September last year. The value of redemptions in 1997 was significantly higher than in 1996, which helps to explain the strong rise in turnover in gilts with a maturity of less than one year—often market participants will switch into other stocks with a slightly longer maturity when gilts are near their redemption date (‘churning’). This helps to maintain

the duration of an investor's gilts portfolio. There are also some large redemptions in the first half of 1998. For example, £8.1 billion of 7¼% Treasury Stock 1998 will be redeemed in March, which will be the biggest redemption in the history of the gilts market.

Data on work volumes (the number, not the value of transactions) in the Central Gilts Office are shown in Chart 10. The number of member-to-member deliveries (transfers of specific stocks) increased slightly from an average of 15,000 per week in 1996, to 15,500 per week in 1997.

**Chart 10**  
**CGO weekly volumes**

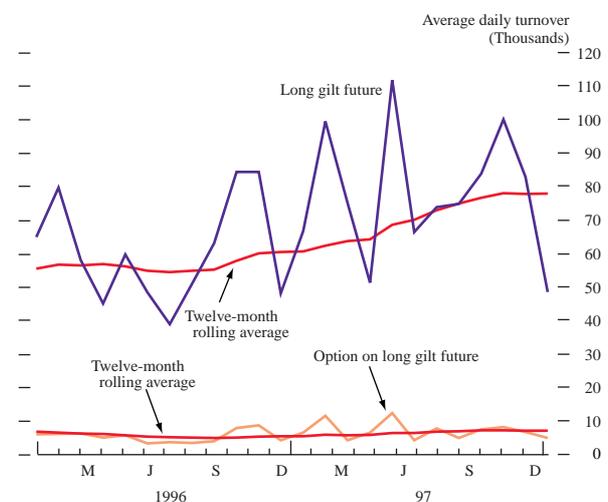


Turnover in long gilt futures on the London International Financial Futures and Options Exchange (LIFFE) increased by almost one third in 1997, averaging 78,000 contracts per day, compared with 60,000 per day in 1996 (see Chart 11). Volumes were highest in February, May and October, when the gilt market rose. Volatility helps to explain the amount of activity in the futures market as well as the cash market. Econometric tests suggest that in 1997, 'implied volatility' (which measures the expected level of volatility over the life of an option) and gilt futures turnover each explained one quarter of the movement in the other variable. But volatility in the gilt market was lower in 1997 than in 1996, so other factors will also have been important in explaining the rise in futures activity last year.

First, it is likely that expected and actual interest rate changes spurred activity in futures through 1997. Second, there is evidence that turnover in long gilt futures is highest in those weeks when there is an auction of gilts by the Bank, as in the cash market. On average, turnover in futures is about 5% higher in auction weeks than in non-auction weeks. Futures allow investors to hedge the interest rate risk on government bonds, and help dealers to manage the risk on their position-taking. Increased use of the futures contract as a hedge at auction times helps to explain the rise in futures turnover, though the rise in gilt futures turnover during auction weeks in 1997 was not as great as the increase in non-auction weeks. Finally, the extension of LIFFE's basis-trading facility to cover gilts in October 1996

has contributed to higher futures turnover in 1997. Basis trading arises from the difference between the clean price of a cash gilt (the price excluding accrued interest) and the clean price at which the gilt is bought through the purchase of a futures contract. This difference is known as the gross basis. Much of the difference can be explained by the difference between the running yield on a gilt and the current repo rate, but a residual amount will be unquantifiable, known as the net basis. For example, it will depend partly on the delivery option implicit in the futures contract (holders of short positions in a futures contract can choose which gilt to deliver, and at which point in the delivery month, hence the implicit option). Traders take positions on the size of the net basis.

**Chart 11**  
**LIFFE gilt derivatives: number of contracts**



Bund futures turnover on LIFFE also appears to be higher in gilt auction weeks—about 9% higher than in non-auction weeks. Again, the rise in bund futures activity in auction weeks in 1997 was not as pronounced as during non-auction weeks.

Reversing the decline of last year, options turnover rose by a third in volume terms, averaging 7,000 contracts a day. Higher options turnover in 1997 is likely to reflect the more mature and liquid futures market in gilts. Greater interest in options also indicates more volatile trading conditions in 1997. Though the growth of the market has been significant, turnover in gilt options remains fairly low relative to the amount of futures contracts traded.

### GEMMS' financial performance

One GEMM left the market last year, leaving a total of 17. In aggregate, the GEMMs continued to make a profit in 1997. Total post-tax profits were reported to be £59 million in 1997, compared with approximately £11 million in 1996. Last year, many GEMMs merged with their parent companies, so the 1997 figure includes GEMM-related business that would previously have been booked outside the GEMM entity (for example, certain hedging and arbitrage trading activities). Last year's figure is therefore not directly comparable with the previous year. It is likely that

the fall in gilt yields through 1997 contributed to GEMMs making a profit, though the aggregate figure masks some significant differences across firms.

The end of the requirement for GEMMs to be separately capitalised meant that many GEMMs have made regulatory

capital savings by conducting their gilts business in the wider entity (as firms have more opportunities to net out positions when calculating their overall risk exposure). It has also meant that these GEMMs will now have access to a larger capital base in the wider entities with which they merged.