United Kingdom
Debt
Management
Office

DMO Annual Review

2001|2002

The United Kingdom
Debt Management Office
is an Executive Agency of
HM Treasury

October 2002

Eastcheap Court
11 Philpot Lane
London EC3M 8UD

Page No

Chapter 1: Introduction

2001-02 was a significant year for the DMO and the sterling debt markets more generally. Economic growth slowed and interest rates fell during the year with the events of 11 September 2001 and their aftermath strongly influencing the market environment. Chapter 2 reviews the economic background against which the DMO's operations were conducted.

As a consequence of slower economic growth, the public finances deteriorated in 2001-02 relative to the previous year. This resulted in a significant increase in the amount of financing the DMO needed to raise. The DMO performed strongly in 2001-02, successfully meeting both its debt and cash management remits from HM Treasury. It also continued to manage successfully the net cash position held on the Debt Management Account[1] (see Chapters 3 and 4). Most of its objectives, and published targets were also met in full. (More details on the DMO's performance are covered in chapters 6 and 8 and Annexes D and E.)

As well as meeting its remits from the Treasury, the DMO took forward a number of policy initiatives this year. The first index-linked switch auction was held in July 2001. The market was also consulted on a possible new design of index-linked gilts, although in the light of responses, it was decided to make only modest changes to the existing design for any new issue of index-linked gilts (coming into effect from July 2002).

In addition, a substantial increase in Treasury bill issuance in the second half of 2001-02 has been supported by a number of reforms, including the introduction of primary participants. Chapter 5 includes these and a number of other market developments. Chapter 7 covers a number of other more general issues in debt management.

During 2001-02 the DMO also expanded its range of services; it worked with National Savings & Investments[2] (NS&I) on their first equity-linked product, the Guaranteed Equity Bond. In February 2002, the Department of Transport Local Government and the Regions (DTLR)[3] announced that the DMO would be introducing (as a pilot scheme) a Deposit Facility to allow local authorities to deposit surplus funds with the Debt Management Account. The facility was successfully introduced in April 2002.

Further expansion for 2002-03 was indicated in the announcement by HM Treasury on 25 March 2002 that the Public Works Loan Board (PWLB) and the Commissioners for the Reduction of the National Debt (CRND[4]) were to be integrated with the DMO and their staff relocated to the DMO's premises on 1 July 2002.

In parallel with these initiatives, the developments in the DMO's governance arrangements, procedures and control framework, introduced with the rapid changes of the previous year, were embedded and consolidated.

---

[1] Following the substantial inflows from the 3G mobile phone spectrum licence auctions in 2000.
[2] Formerly National Savings.
[3] Now Office of the Deputy Prime Minister (OPDM)
[4] Then known as the National Debt Office (NDO)

Chapter 2: Review of market conditions

The macro-economic environment

During 2001-02, the UK economy experienced a slowdown in economic growth. GDP grew by 1.6% in real terms over the period, compared to 2.9% in 2000-01. Within GDP, household expenditure grew 3.9% and government expenditure rose 3.9% over the year, contributing 2.6% and 0.7% to overall growth respectively. Conversely, investment spending fell by 2.3% and net exports declined by 12.9%, resulting in negative contributions to growth of 0.4% and 0.8% respectively.

Inflation[5] ranged between 1.8% - 2.6% over 2001-02 and averaged 2.3% for the period (relative to the Bank of England's target of 2.5% +/-1%); it stood at 2.3% at the end of the financial year.

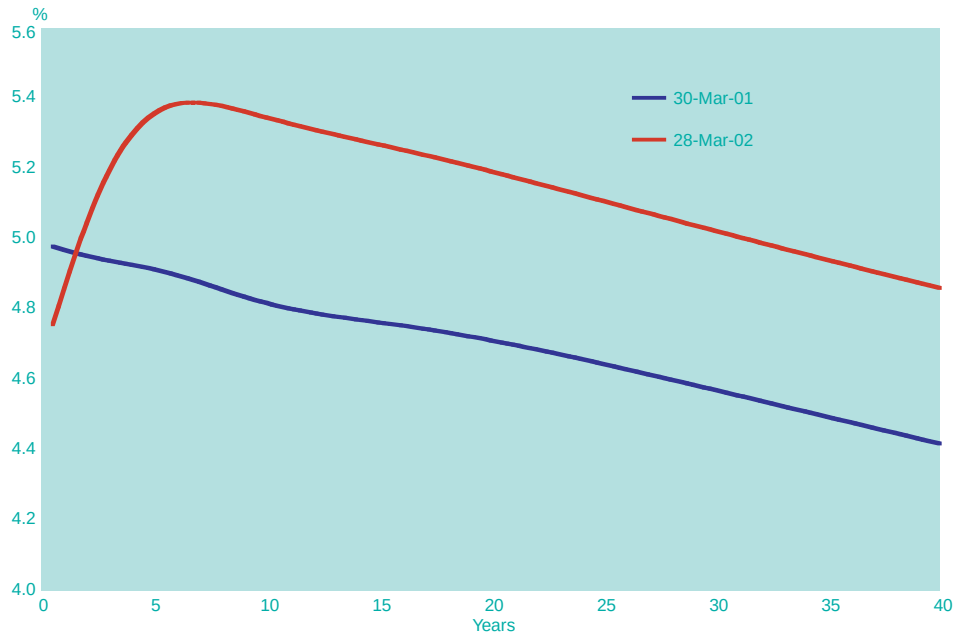
In terms of the UK's public finances, by the end of the financial year public sector net debt had declined to 30% of nominal GDP (from 31% at end-2000-01) whereas central government gross debt fell to 37% of nominal GDP (from 39% a year earlier). However, reflecting the general slowdown in economic growth in 2001-02, the absolute level of public finances deteriorated. The public sector net cash requirement for the year was £4.6 billion; resulting in a central government net cash requirement (CGNCR) for 2001-02 of £2.9 billion, a change of £38.1 billion relative to the exceptional surplus seen the previous financial year. This led to a significant increase in the net financing requirement for 2001-02 (see chapter 3).

Developments in the sterling fixed income markets

2001-02 saw a significant change in the level and shape of the gilt yield curve (see chart 1). At the ultra-short end of the gilts market (gilts with maturities of around 18 months or less), yields fell, with the one-year par yield falling 11 basis points (bp) to 4.86%. In contrast, over the same period, yields at medium and longer maturities (over 5 years) increased significantly, by around 50bp. These movements resulted in a sharp disinversion of the short-end of the curve combined with continued inversion at the medium to long-end such that, at the end of the year, the curve peaked at 5.39% in the 6-year area.

[5] As measured by the annual percentage change in RPIX (the retail price index excluding mortgage interest payments).

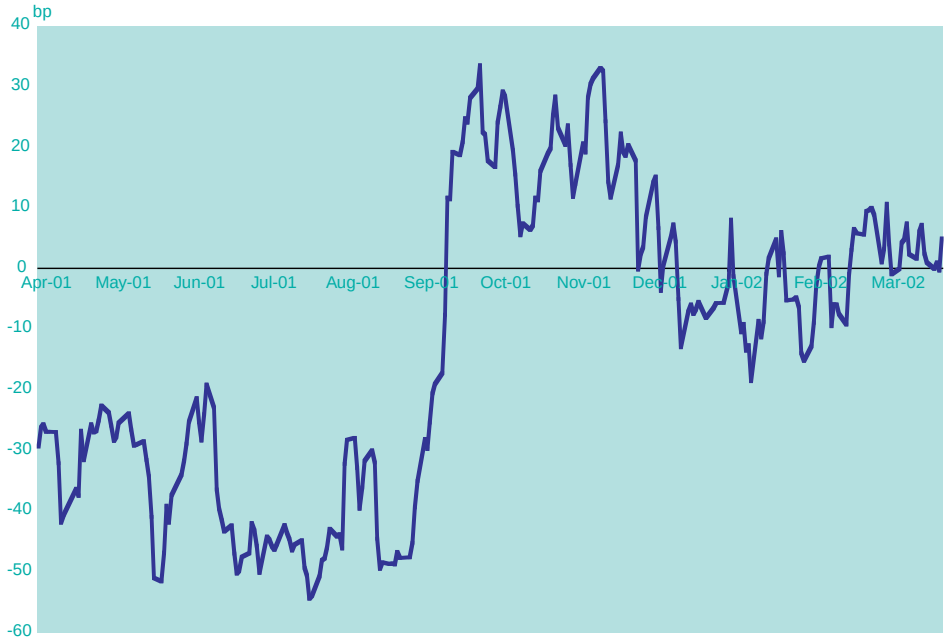
Chart 1
Par gilt yield curves



Source: DMO

Chart 2 reflects these general movements in short and long yields, showing that the spread between $6^1/_2$% Treasury Stock 2003 and $4^1/_4$% Treasury Stock 2032 moved from -29bp at the start of the financial year, to +5bp by the end of the year. The spread between the two stocks reached a maximum of -54bp on 19 July, reflecting the under-performance of short maturity gilts early in the year. However, this under-performance was dramatically reversed following the terrorist attacks of 11 September (see below) resulting in a switch in the spread from negative to positive as short yields fell below long yields.

Chart 2
Spread between $6^1/_2$% Treasury Stock 2003 and $4^1/_4$% Treasury Stock 2032



Source: DMO

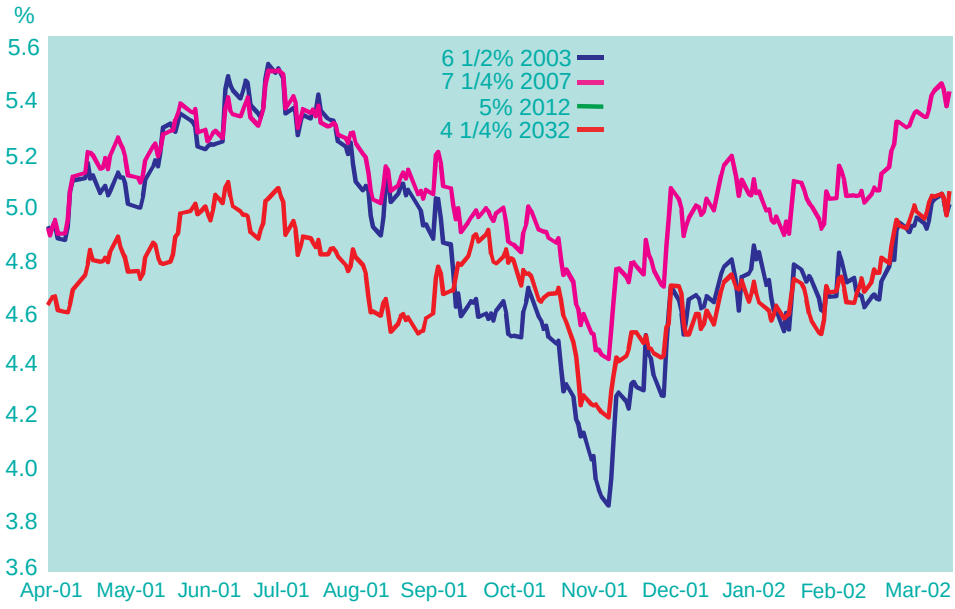
Between April and July 2001, yields at all maturities increased (see chart 3), peaking on 29 June. Longer maturities out-performed shorter maturities, with 2-year yields increasing 61bp relative to a 40bp increase in 30-year yields over the same period. These movements reflected market expectations of an imminent increase in interest rates. Many market participants believed that interest rates had reached their trough following the cuts of the Bank of England's repo rate at the April and May Monetary Policy Committee (MPC) meetings.

However, following a deterioration in the outlook for the global, and domestic, economy, the Bank's repo rate was cut at the August MPC meeting. This was followed by further cuts at the emergency meeting on 18 September, the October and the November (50bp) MPC meetings, as the terrorist attacks of 11 September exacerbated that deterioration. This altered interest rate sentiment generally, and, as a result, yields at all maturities fell.

Chart 3 shows that the yields on the 2-year, 5-year, 10-year and 30-year benchmarks fell 162bp, 108bp, 91bp and 85bp respectively from 1 July to 12 November, on which date yields on all maturities reached a low for the financial year.

Yields on all maturities proceeded to rise sharply after this date. This reflected market reaction to the recent cuts in the Bank's repo rate alongside signs of continued consumer strength in the UK and less negative economic data from the US. From their low on 12 November 2001, the 2-year and 30-year maturities increased 112bp and 85bp to finish the financial year at 4.96% and 5.01% respectively.

Chart 3
Benchmark gilt yields 2001-02



Source: DMO

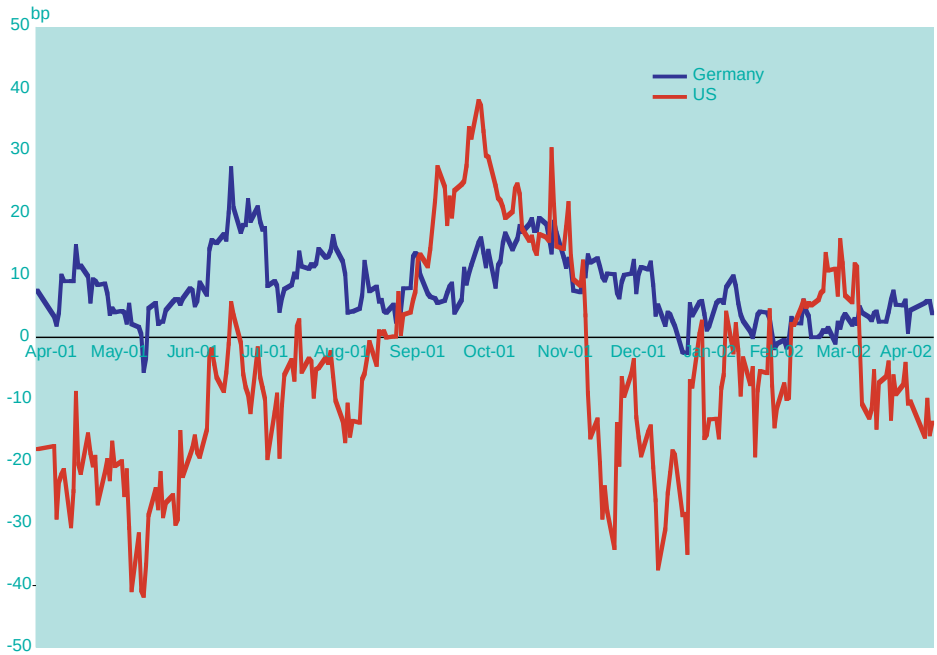
International Comparisons

Chart 4 shows the spread of 10-year gilt yields over German government bond (bund) yields in 2001-02 ranging from –6bp to 27bp, with an average of 8bp (i.e. on average, gilt yields were 8bp higher than the equivalent bund yield). In contrast the spread of 10-year gilts over 10-year US Treasuries was much more volatile during the period. Spreads ranged between –41bp and 38bp with an average of –5bp.

In line with the general deterioration in global and domestic growth prospects, the ECB reduced interest rates in the euro-zone by 25bp in May and August 2001. Following events in the US, there were two further cuts, this time of 50bp each, in September and November 2001.

Official interest rates in the US were cut much more aggressively with eleven cuts during the calendar year, with the last cut (25bp) in December. This brought US official rates to 1.75%, their lowest rate for 40 years. These cuts were considered necessary to stimulate aggregate demand and bring the economy out of the recession that had officially begun in March 2001 according to the National Bureau of Economic Research (NBER) Recession Dating Committee.

Chart 4
Spread of 10-year gilt yields over German and US 10-year yields

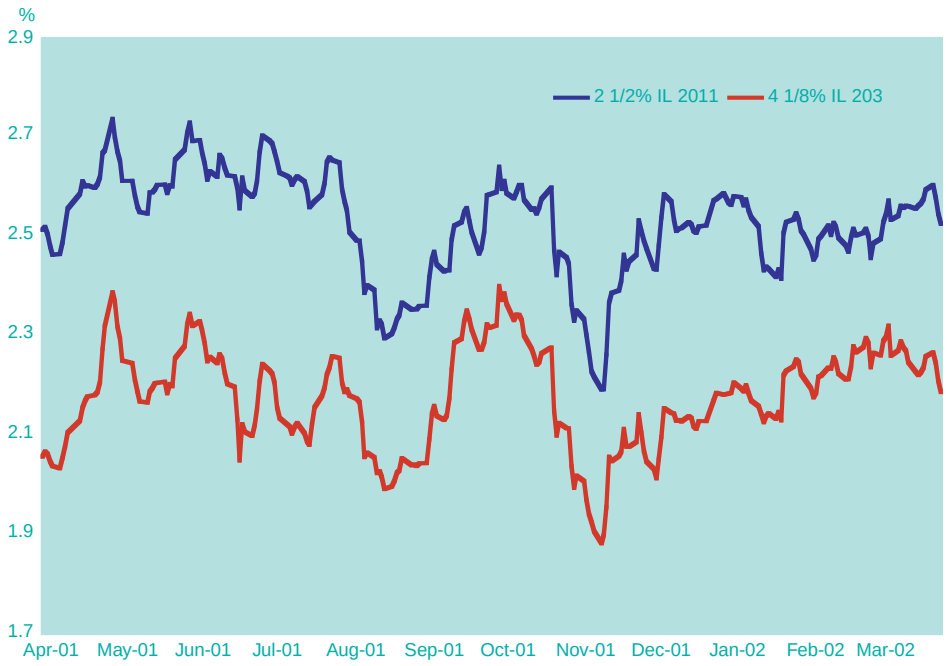


Source: DMO

Index-linked gilts

Over 2001-02, the real yield curve became slightly less inverted. Real yields on 10-year index-linked gilts were virtually unchanged, starting the financial year at 2.51% and ending at 2.52%, while the 30-year yield increased 14bp from 2.05% to 2.19% (see chart 5). As with conventional gilts, yields on index-linked gilts reached their low for the financial year on 12 November 2001.

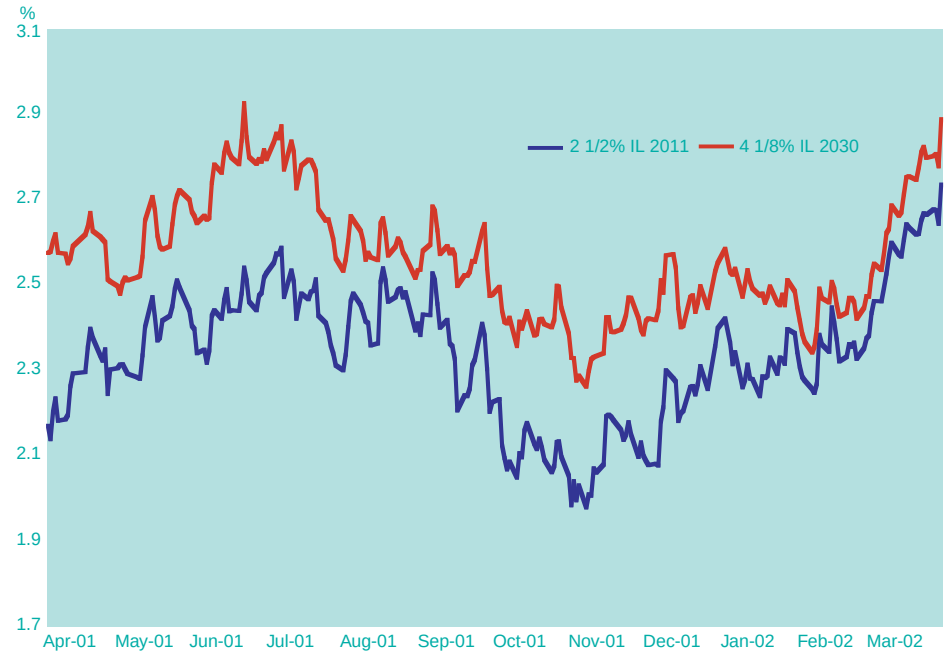
Chart 5
Real yields on 10- and 30-year index-linked gilts



Source: DMO

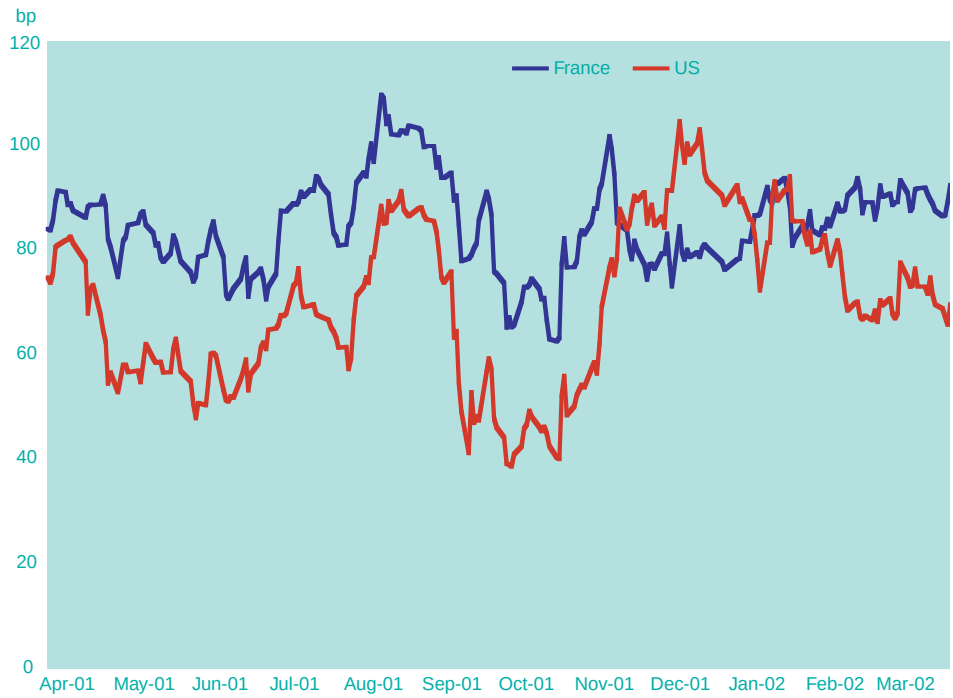
Index-linked gilts out-performed conventionals over 2001-02, resulting in an increase in break-even inflation rates. Chart 6 shows the break-even inflation rates at 10- and 30-year maturities. The 10-year rate increased 57bp to 2.73%, whilst the 30-year rate increased by 31bp to 2.88%.

Chart 6
10- and 30-year break-even inflation rates



Source: DMO

Chart 7
Spread of Medium French and US real yields to UK



Source: Bloomberg

Chart 7 indicates that UK medium index-linked real yields (2009 maturity) were substantially lower than their French and US counterparts. French index-linked yields averaged 85bp above the UK (ranging from 63 to 110bp) while US yields averaged 70bp above the UK (ranging from 39 to105bp). On 31 October 2001, France issued a new 10-year bond linked to the euro-zone inflation index (Oat€i), the first of its kind.

Demand factors

Insurance companies and pension funds are by far the most significant investors in gilts. At the end of March 2002 the market value of gilt holdings by this sector was estimated by the ONS (Office for National Statistics) to be £217.2 billion[6], equivalent to nearly 72% of the market value of the gilts portfolio.[7] However, gilts were only the third largest investment by instrument, with UK company securities by far the largest, accounting for some £819 billion of funds invested, followed by overseas securities (£351.4 billion).

As the dominant investor class any changes within the pension and insurance industry can have a significant impact on demand in the gilts market. The UK pension industry has undergone a series of reforms to its regulatory and accounting environment since the Pensions Act (1995) introduced the Minimum Funding Requirement (MFR).[8] The latest change has come with the introduction of a new accounting rule, the Financial Reporting Standard, FRS 17. This has generated considerable comment in the UK media about the future of 'final-salary' pension schemes as well as on the incentives for pension funds to hold gilts and other types of bonds (see below).

---

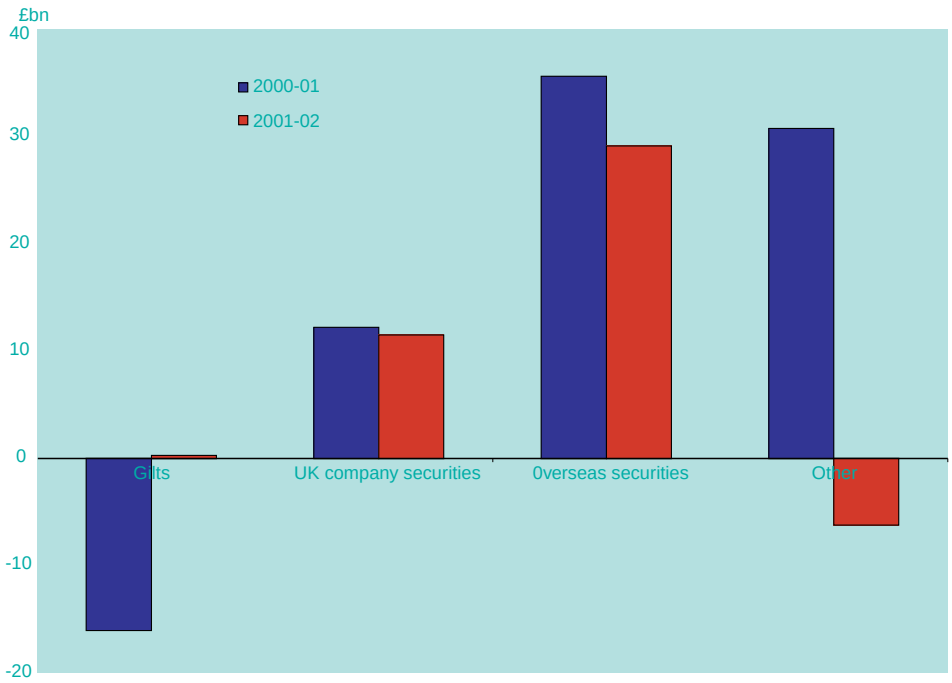
[6] ONS, monthly Financial Statistics publication.
[7] Note there appears to be some inconsistency between these figures and the data on gilts holdings produced by the ONS on a quarterly basis. However, both sets of data indicate that insurance companies and pension funds are the most significant investor class in gilts.
[8] For a discussion of the impact of the MFR on the gilts market see the 1998-99 UK DMO Annual Gilt review.

While, FRS 17 may encourage pension funds to increase their holdings of gilts, there have been many other fundamental changes affecting the UK pension and gilts markets in recent years, including long-term demographic trends, low levels of primary issuance and volatile equity markets. All these factors have also contributed to strong demand for gilts.

Net investment by insurance companies and pension funds

2001-02 saw a return to net investment in gilts by insurance companies and pension funds, by some £0.3 billion (after a net dis-investment of £16 billion in 2000-01). However the major investment flows were into UK company securities (£11.5 billion), predominantly into bonds (the sector was a net dis-investor from shares to the tune of £14.8 billion in 2001-02), with the largest net investment flows into overseas securities. Net investment over the past two financial years is shown in chart 8.

Chart 8
Net investment by insurance companies and pension funds (by instrument)



Source: ONS

What is FRS 17

The independent UK Accounting Standards Board (ASB) developed the new Financial Reporting Standard for retirement benefits, FRS 17, following a lengthy consultation process. The objective of FRS 17 is to ensure that:

- financial statements reflect at fair value the assets and liabilities arising from an employer's retirement benefit obligations;
- the operating costs of providing retirement benefits are recognised in the relevant accounting period; and
- there is adequate disclosure in the company's financial statements.

Because FRS 17 is likely to have a major impact on companies' financial statements and pension policies the ASB opted for a gradual implementation. The first phase, mainly an increase in balance sheet disclosures, applied to accounting periods after 21 June 2001. Full compliance was initially required for accounting periods after June 2003. However, in July 2002 the ASB proposed an amendment to extend the transitional arrangements and therefore defer the mandatory requirement for full adoption[9]. This was the direct result of an announcement by the International Accounting Standards Board (IASB) that the corresponding international standard, IAS 19, would be reconsidered. The IASB standards are due to be adopted in the UK from 2005 and the ASB wishes to ensure the smooth transition between standards. In the run up to 2005, UK financial statements will include disclosure of information prepared in accordance with FRS 17 either in footnotes or, on a voluntary basis, in the main financial statement.

It is on companies with defined benefit (DB) pension schemes (such as final salary schemes) that FRS 17 will impact, as FRS 17 has not materially changed the accounting treatment of defined contribution (i.e. money purchase) schemes. The basic changes of FRS 17 require companies to:

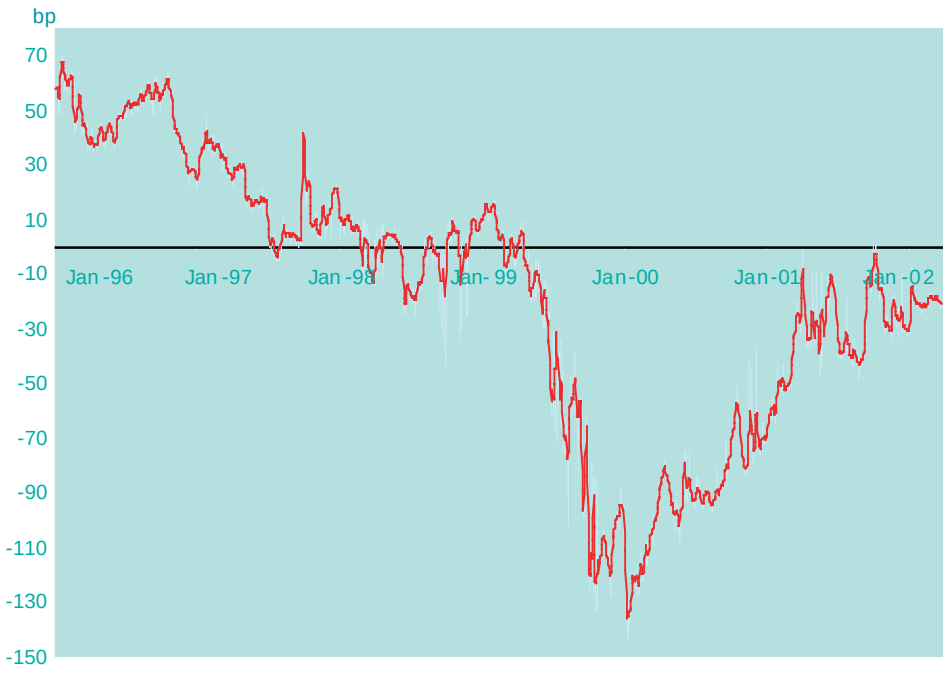
- highlight pension related operating and financing items separately within the profit and loss account (P&L). Actuarial gains or losses from pension funds, which were often spread over the expected working lives of the employees through 'smoothing' assumptions, will not now feature in the P&L;
- record the value of company pension scheme assets based on market valuations rather than assumed actuarial values;
- record the liabilities of the company pension scheme, valued using asingle defined discount rate (based on the yield of AA corporate bonds of similar maturity and currency rather than an expected equity return) and use a defined actuarial method of recognising pension costs; and
- recognise the pension scheme's surplus (or deficit) on the balance sheet in the Statement of Total Recognised Gains and Losses (STRGL).

[9] See the ASB website on www.asb.org.uk for further information.

FRS 17 and the gilts market

Institutional demand for long-dated gilts has been particularly high in the UK in recent years as reflected in the humped shape of the yield curve (see Chart 1). Chart 9 shows that the yield spread between 25-year and 10-year gilts narrowed after the introduction of the MFR in 1995-96 and has been consistently negative since April 1999 (i.e. the yield curve has been inverted at the long-end), though the spread has narrowed considerably since its peak in January 2000.

Chart 9
Spread between 25-year and 10-year gilt yields January 1996 - March 2002



Source: DMO, zero coupon yield curves

In so far as FRS 17 encourages companies and pension fund trustees to match more closely variations in the value of their assets and liabilities, now valued using a specific discount rate (the AA sterling corporate bond yield), they may shift their asset allocations towards bonds.

However, the AA sterling market is small relative to the value of investible funds held in UK pension funds (with some £750 billion in assets at the end of 2000[10]). Pension funds may consequently move more into AAA-bonds, the gilts market and other mixed portfolios of gilts and corporate bonds that closely match their discounted liabilities.

This shift in resources is potentially substantial, as the UK pension industry has traditionally had a strong preference for equities. A recent market survey, which covered around £211.5 billion of DB pension assets, found that some 67% of total assets were invested in equities[11]. At its most extreme the pharmaceutical retail company Boots PLC moved all their pension fund assets, around £2.3 billion, predominantly from equities into bonds in 2001.

[10] ONS, Financial Statistics.
[11] JP Morgan Fleming Asset Management, Annual Defined Contribution Industry Survey 2002

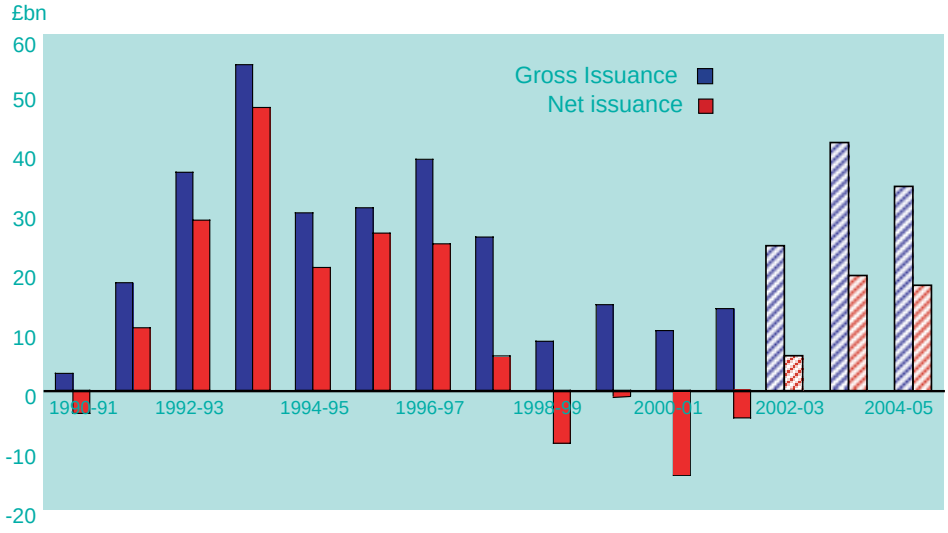
While it is conceivable that FRS17 may have increased the demand for gilts during 2001-02 the extent of the shift in asset allocations also depends on the availability and relative cost of close substitutes. As outlined above, pension funds and insurance companies were significant net investors in corporate sterling bonds during 2001-02 (the supply of which is discussed below). Over the long-term any distortions to the gilts market caused by changes to the regulatory or accounting environment should prove temporary, as market participants become more adept at investing in non-gilt securities and other borrowers enter the market to take advantage of the high demand for debt securities.

Other demand factors

The relatively high demand for long maturity gilts cannot be attributed solely to regulatory and accounting changes in the pension fund market. For example the 10-year to 25-year yield spread peaked in January 2000, following a series of economic crises in Asia and the collapse of the hedge fund, Long-Term Capital Management, in the US which boosted demand for long-dated high quality bonds in a 'flight to quality'. The largest global equity markets generated negative returns in 2000 and 2001 and this may have spurred some switching of assets into general fixed income markets, including gilts.

Alongside those developments and reflecting the general health of the government's finances, gross gilts issuance has also been relatively low for the past 4 years resulting in negative net gilt issuance. The effect of this reduced supply of gilts has been to increase prices, and thus decrease yields, as their scarcity value rose. Chart 10 shows the marked contraction of net gilt issuance over the previous four years and how the government's financing requirement (and as a result gross issuance) is forecast to increase over the coming few years.

Chart 10
Gross and net gilt issuance 1990-91 to 2004-05 (including forecasts/assumptions)[12]



Source: HM Treasury, DMO

[12] Projections by DMO for 2003-04 and 2004-05 are based on CGNCR forecasts in Budget 2002 with net short-term debt sales, NS&I and foreign exchange reserve contributions assumed to be zero.

However, underlying demographics may have had the largest effect on UK pension funds asset allocation behaviour. As existing funds mature and the proportion of inactive members increases, pension funds will increase their demand for conventional and index-linked bonds, which are a better match than equities for a defined liability. Mortality rates have also been increasing in the UK[13], which again alters the share of inactive to active members.

Some actuaries have recently gone further by asserting that equities are not an optimal investment vehicle to match pension funds liabilities, even in the long-run. The Boots management have justified their move to an exclusively bond based portfolio on the basis of improving the asset-liability match of the pension fund, rather than any of the recent regulatory or accounting changes.

All of the above factors are likely to have contributed to the relative attractiveness of long-dated conventional and index-linked gilts over the last few years. Over the short- to medium-term, none of the above factors will necessarily reverse. Indeed, the likely tightening of international regulatory and accounting standards and increasing awareness of pension liability issues within the European Union, including the possible adoption of a European Pensions Directive, might have a similar, if less pronounced[14], impact in other countries. This could also reduce the relative attractiveness of European bonds as substitutes for gilts (see chart 7, for example).

The corporate sector

In 2001-02, non-gilt sterling issuance totaled £72.4 billion, (slightly down from the £77.2 billion issued in 2000-01) with issuance peaking in November and December 2001. £18.5 billion of bonds were issued over these two months (see Charts 11 and 12). This probably reflected the impact of issuance being postponed following 11 September as borrowers waited for the market environment to improve.

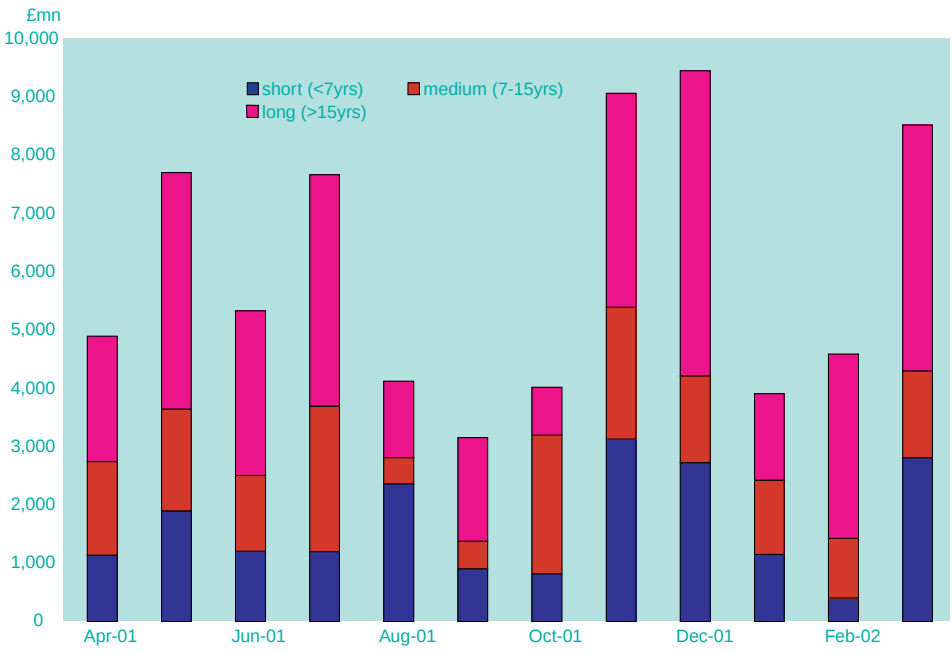
Overall for the period, issuance was concentrated in long-dated issues, with 48% of the total issuance of more than 15-years maturity when issued. A-rated issuers were the largest category of issuer, accounting for 34% of total issuance. However, in December 2001, BBB (and below)-rated issuers constituted 31% of the total amount issued in that month.

---

[13] It is estimated that the life expectancy of a 60-year old has risen by around a third since 1970.

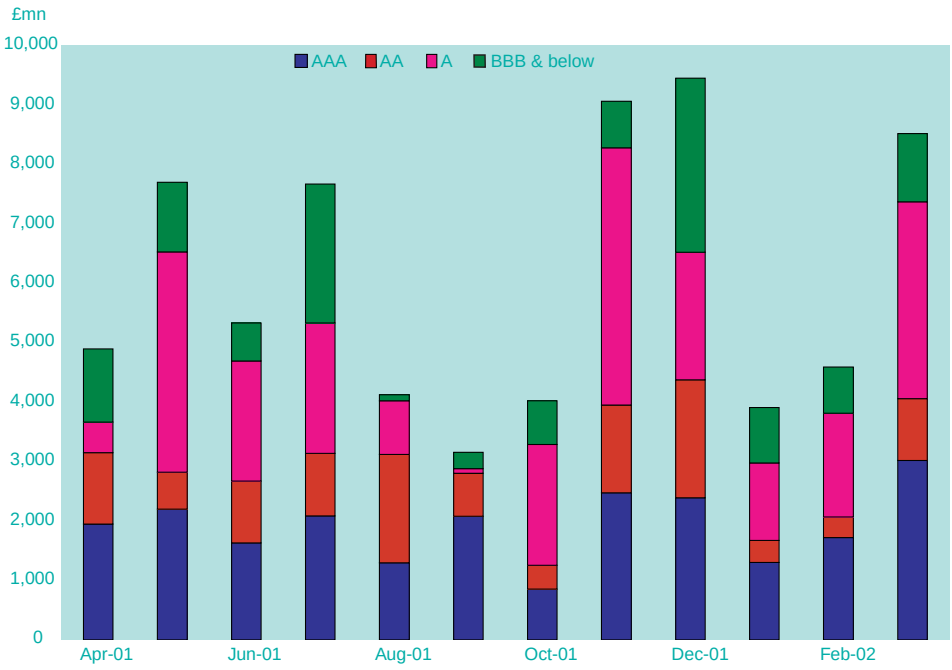
[14] Europe generally has a different pension fund structure to the UK, which could temper the impact of any switch in the investment preferences of pension funds, although the demographic trends are similar.

Chart 11
Monthly non-gilt sterling bond issuance, 2001-02, by maturity



Source Bank of England

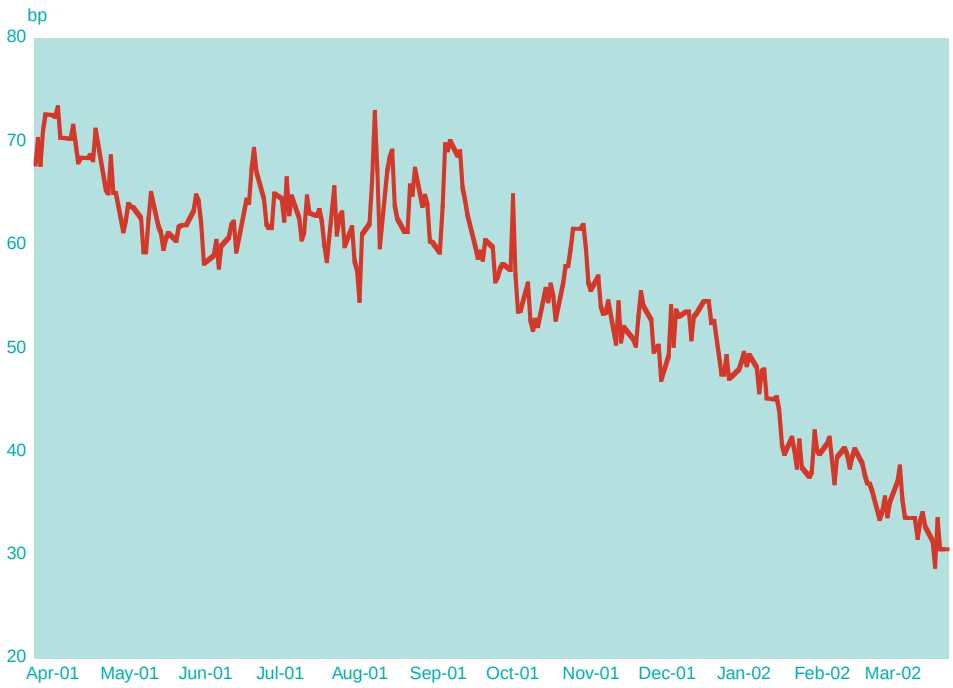
Chart 12
Monthly non-gilt sterling bond issuance, 2001-02, by rating



Source Bank of England

The 10-year swap spread (the difference between the benchmark gilt yield and the equivalent sterling interest rate swap rate) was relatively stable at around 65bp over the course of the first half of the financial year. However, it declined rapidly in the latter half as sentiment about future economic prospects improved, coming in 35bp to end the financial year at 30bp. This marked a return of swap spreads to the general levels seen pre-LTCM. The change in the swap spread does not appear to have led to any significant increase in amounts issued.

Chart 13
10-year swap rate over 10-year gilts



Source: Bloomberg

Developments in the sterling money markets

During 2001-02, the combined size of the sterling money market increased by 5.8%, compared to the 14.9% increase for the previous period (see Table 1). But as before, most of this growth was concentrated in the interbank market, which grew by 11.2%. The nominal value of Treasury bills outstanding increased by almost 3 times in size (see chapter 4), whilst the amount of Commercial Paper (CP) outstanding rose by 16%. On the other hand, Bank bills and Certificates of Deposit (CDs) fell by 14.8% and 1.6% respectively.

Table 1
Size of the sterling money market (£ millions)

(end-month)	CDs	Treasury bills	Bank bills	CP	Interbank	Gilt repo	Stock lent	Sell/ buy-backs	TOTAL
Mar-01	141,337	3,300	13,689	19,285	171,134				544,755
Apr-01	143,200	2,080	13,082	18,773	173,613				546,757
May-01	139,768	1,938	12,142	19,369	174,504	127,652	66,551	2,058	543,983
Jun-01	130,958	3,477	12,165	21,780	177,169				541,810
Jul-01	131,130	2,776	12,046	21,332	176,255				539,799
Aug-01	136,293	2,228	11,857	21,723	181,749	144,022	51,704	3,838	553,413
Sep-01	133,718	2,600	11,597	20,860	186,657				554,996
Oct-01	142,381	4,900	12,875	21,184	187,499				568,404
Nov-01	140,567	8,150	12,672	22,200	191,428	130,242	48,384	4,275	557,917
Dec-01	130,743	11,200	11,544	20,326	184,835				541,54
Jan-02	137,083	10,750	11,773	21,934	176,473				540,914
Feb-02	136,843	7,850	11,986	20,813	181,072	134,366	66,372	3,045	562,347
Mar-02	139,022	9,700	11,660	21,830	190,327				576,322

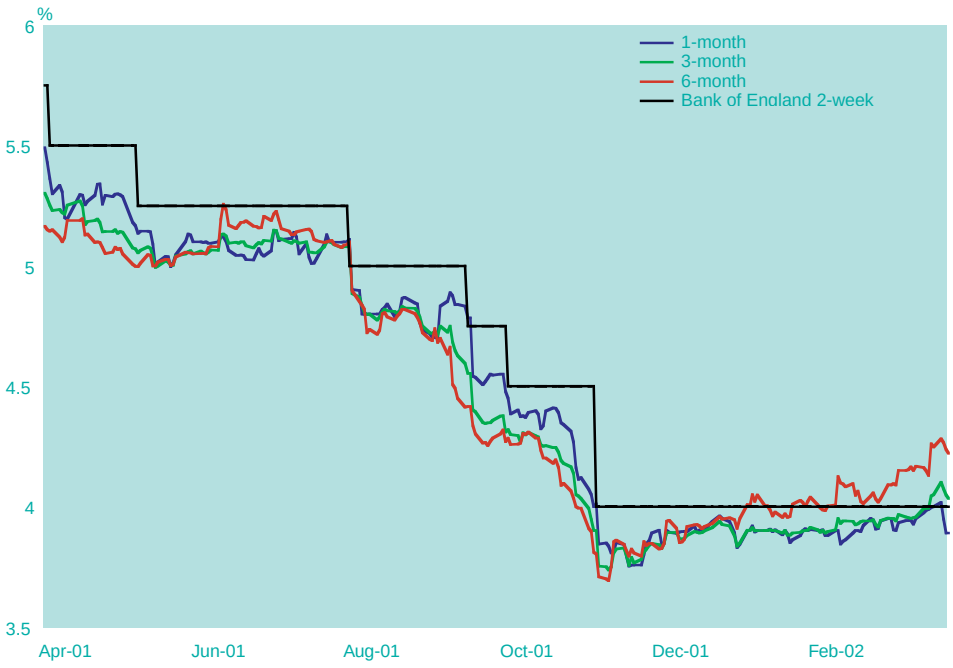
* Gilt repo and stock lending data is based on a quarterly survey of the market. For the purposes of this table these values are assumed to remain constant during the intervening two months

Source: Bank of England

Short-term money market rates

The Bank of England's 2-week repo rate was cut on six separate occasions during the year, falling from 5.75% at the start of the period to 4% by November 2001 and then staying at that level for the remainder of the year (see chart 14). Chart 14 also shows the movement in secured lending rates[15] during the year. Gilt GC rates for one-, three- and six-month lending remained below the Bank of England's 2-week repo rate for most of 2001-02. The six-month gilt GC rate started the year 58bp below the Bank's repo rate, reflecting the expectation that the Bank of England would ease policy rates over the coming months. Again, reflecting market expectations of an imminent cut in policy rates, the spread between the Bank of England's 2-week repo rate and the six-month gilt GC rate peaked at 69bp in November 2001, the day before the Bank cut its policy rate by 50bp. As sentiment about the prospects for a global economic recovery improved during the first quarter of 2002, and consequently as expectations of a near-term increase in policy rates grew stronger, the six-month gilt GC rate increased and finished the year 22bp above the Bank's 2-week repo rate.

Chart 14
BBA Gilt GC repo rates and Bank of England 2-week repo rate

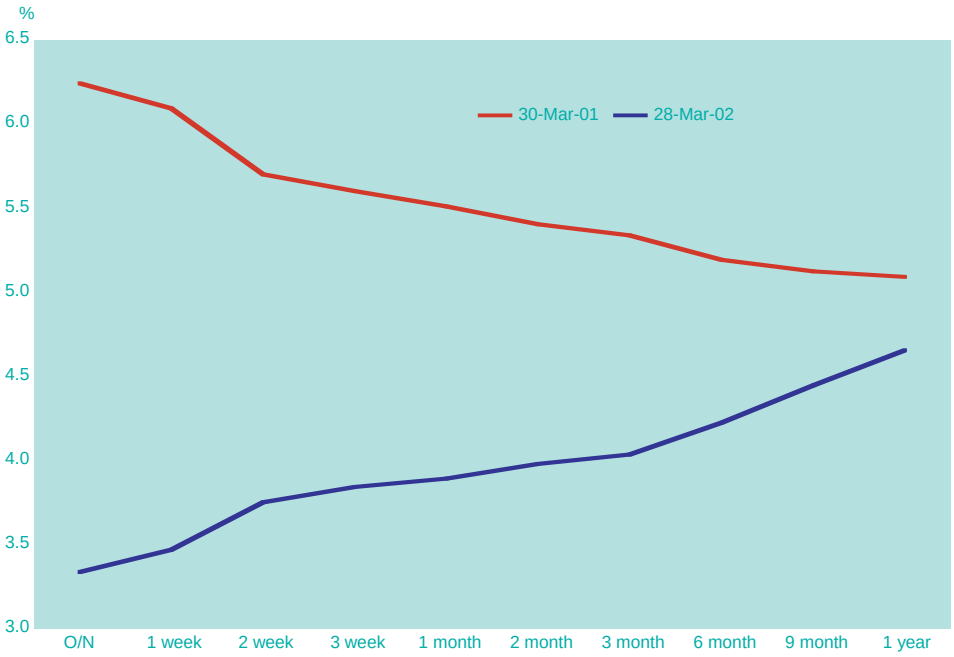


Source: British Bankers Association (BBA)

The change in money market expectations for the direction of interest rate movements between the start and end of 2001-02 was also reflected in the term structure of gilt GC rates shown in chart 15. The spread between 1-year and 2-week gilt GC rates was -61bp on 30 March 2001, with policy rates expected to be cut. However, by the end of the year, market sentiment had changed, with improved prospects for economic growth and the belief that UK policy rates had reached a trough, with the next move in policy rates expected to be up. Again, this is reflected in the positively sloped yield curve, with the 1-year to 2-week spread at +90bp.

[15] BBA gilt collateral (GC) repo rates.

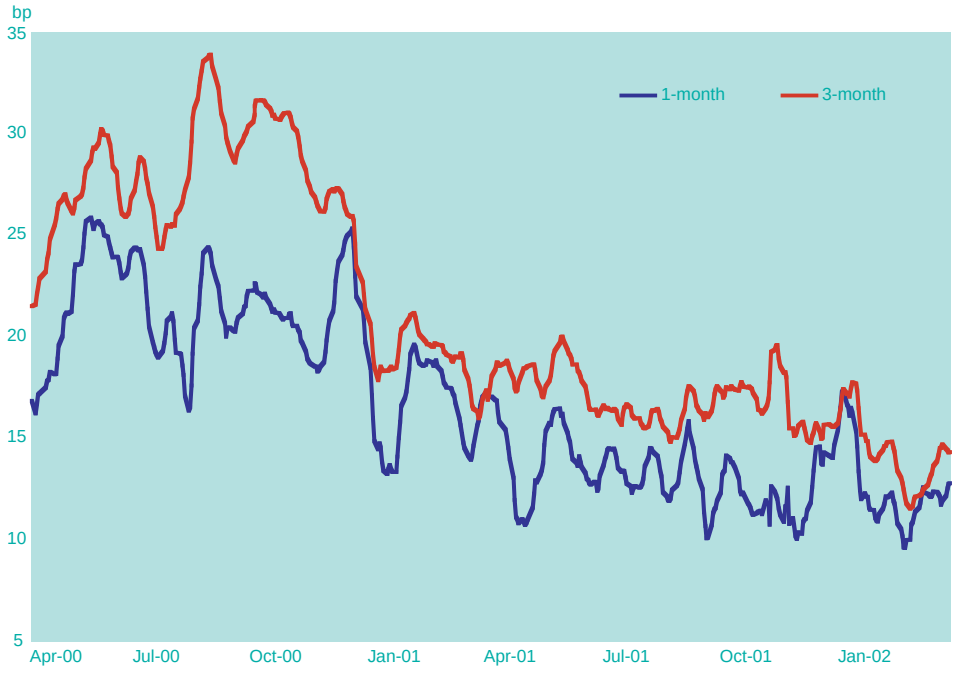
Chart 15
Money market interest rate curves: Gilt GC repo rates



Source: BBA

As Chart 16 indicates, the spread between secured and unsecured borrowing rates in the sterling money markets have generally narrowed over the last couple of years as credit concerns diminished.[16] At the start of 2000-01, average spreads between gilt GC (bid rate) and LIBOR were around 20bp (1-month), and 30bp (3-month) but these have since narrowed to around 12bp, (1-month) and 14bp (3-month); most of the narrowing took place towards the end of 2000-01.

Chart 16
Spread between 1-month and 3-month LIBOR and BBA GC repo rates (2-week rolling averages)



Source: BBA

[16] For example, 10-year swap spreads returned to pre-LTCM levels, see chart 13.

Chapter 3: The gilts remit 2001-02

Gilt sales at auctions were £13.7 billion (cash) in 2001-02, £0.2 billion more than planned at the start of the financial year but £0.3 billion below the revised gilt sales target of £14.0 billion published in the Pre- Budget Report.

Two new conventional gilts (5% Treasury Stock 2012 and 5% Treasury Stock 2025) were issued, with the former being the first medium maturity gilt to be auctioned since September 1999.

The gilts remit

The remit of 7 March 2001

Planned gilt sales of £13.5 billion (cash)[17] were published in the remit for 2001-02 on 7 March 2001; this was based on a forecast central government net cash requirement (CGNCR) of £0.3 billion. A net financing requirement of £23.4 billion was projected after taking account of gilt redemptions (£17.8 billion), pre-financing of foreign currency debt (£1.3 billion), gilt buy-backs (£1.0 billion) and a forecast negative contribution to financing of £3.0 billion by National Savings.

The £23.4 billion requirement was to be met by:

- **Gilt sales of £13.5 billion, split as follows:**
  - medium conventionals £4.75 billion
  - long conventionals £5.0 billion
  - index-linked gilts £3.75 billion

- **Short-term debt sales of £9.9 billion, split as follows:**
  - an increase in the stock of Treasury bills of £5.0 billion to £8.5 billion; and
  - a run-down of the DMO's net cash position of £4.9 billion to £6.8 billion.

As in previous years, the remit specified a number of contingencies that would be considered in the event of substantial revisions to the forecast financing requirement. These were:

- **In the event of a rising financing requirement:**
  - increasing planned gilt sales;
  - increasing the planned stock of Treasury bills; and
  - increasing the planned run-down of the DMO's net cash position.

- **In the event of a falling financing requirement:**
  - increasing the size of debt buy-backs (including the re-introduction of reverse auctions) by up to £1.5 billion;
  - reducing planned gilt sales;
  - reducing the planned increase in Treasury bill sales;
  - slowing the run-down of the net cash position; and
  - some repayment (up to £1 billion) of the Ways and Means Advance at the Bank of England.

---

[17] Unless indicated otherwise references to planned gilt sales are in cash terms.

Publication of the CGNCR outturn on 23 April 2001

There was no change to the planned level of gilt or Treasury bill sales in 2001-02, following the publication of the outturn CGNCR for 2000-01 of -£35.2 billion on 23 April 2001. The outturn represented an increase of £1.9 billion in the surplus since the March 2001 Budget forecast, but the net financing requirement for 2000-01 fell by only £1.4 billion as a result of higher debt buy-backs (£0.2 billion), a higher DMO cash deposit at the Bank of England (£0.3 billion), an increase in the pre-financing of foreign exchange reserves (£0.1 billion) and a lower negative financing contribution by National Savings (£0.1 billion) by comparison with the forecast in the Budget.

The impact of these changes was reflected in the level of short-term debt sales. Treasury bill stocks ended the 2000-01 financial year £0.2 billion lower than forecast in the Budget (at £3.3 billion) and the DMO's net cash position increased by £1.2 billion (to £12.9 billion excluding the DMO's cash deposit at the Bank of England) compared with the Budget forecast.

Pre-Budget Report on 27 November 2001

In the Pre-Budget Report (PBR) on 27 November 2001, the forecast of the CGNCR for 2001-02 was increased by £6.0 billion to £6.3 billion. Offsetting this, however, were a reduction of £0.5 billion (to £0.5 billion) in the planned level of debt buy-backs by the DMO and an increase of £3.0 billion in the forecast for National Savings' net contribution to financing. The forecast net financing requirement therefore increased by £2.5 billion, to £25.6 billion. Accordingly, in line with the contingencies outlined above further changes were made to the DMO remit as follows:

- an increase of £0.5 billion in planned gilt sales to £14.0 billion, with the increase being reflected in long conventionals;
- an increase of £1.4 billion in planned Treasury bill sales taking the planned end-March 2002 stock of Treasury bills to £9.7 billion;
- a planned increase of £0.6 billion in the run-down of the DMO net cash position, reducing the forecast net cash position to £8.1 billion by end-March 2002.

Debt and Reserves Management Report, 14 March 2002

The financing arithmetic was restated on 14 March 2002 with the publication of the Debt and Reserves Management Report (DRMR). The only changes were in the level of planned gilt sales which, at £13.7 billion, were £0.3 billion below the forecast at the time of the PBR, a slightly lower sterling amount (£0.1 billion) needed to pre-finance foreign currency debt and a revision to NS&I's net contribution. These changes resulted in a corresponding increase in the level of short-term debt sales.

Budget 17 April 2002

The outturn for the 2001-02 CGNCR was published with the Budget on 17 April 2002. The size of the cash requirement fell by £3.4 billion to £2.9 billion, (and the financing requirement fell by the same amount to £22.3 billion). However, since gilt and Treasury bill sales for 2001-02 had been completed, the impact was reflected in a lower run-down of the DMO net cash position than anticipated in March (only £2.2 billion compared with £5.6 billion).

Table 2
The gilt financing arithmetic 2001-02

(£ billion)	Budget 07-March-2001	Revision 23-April-2001	PBR 27-November-2001	Revision 14-March-2002	Budget 17-April-2002
CGNCR forecast	0.3	0.3	6.3	6.3	2.9
Prefinancing forex debt	1.3	1.3	1.3	1.2	1.2
Gilt redemptions	17.8	17.8	17.8	17.8	17.8
Buy-backs	1.0	1.0	0.5	0.5	0.6
Financing Requirement	**20.4**	**20.4**	**25.9**	**25.8**	**22.5**
less					
National Savings and Investments	-3.0	-3.0	0.0	-0.2	-0.2
DMO cash deposit at Bank of England	0.0	0.3	0.3	0.3	0.4
Net Financing Requirement	**23.4**	**23.1**	**25.6**	**25.7**	**22.**
Financed by:					
Planned gilts sales	**13.5**	**13.5**	**14.0**	**13.7**	**13.7**
Planned net short term debt sales	**9.9**	**9.6**	**11.6**	**12.0**	**8.6**
Short term debt					
Change in Ways & Means	0.0	0.0	0.0	0.0	0.0
Change in T bill stock	5.0	5.0	6.4	6.4	6.4
Change in DMO net cash position*	4.9	4.6	5.2	5.6	2.2
Total	**9.9**	**9.9**	**11.6**	**12.0**	**8.6**
Short term debt levels					
Ways & Means at end of FY	13.4	13.4	13.4	13.4	13.4
T bill stock at end of FY	8.5	8.3	9.7	9.7	9.7
DMO net cash position at end of FY**	6.8	8.7	8.1	7.7	11.0

** excl deposit at BoE*
*** inc deposit at BoE*

Outright gilt auctions

The 2001-02 remit included a calendar of eight outright gilt auctions (four each of conventional and index-linked). The year saw the issuance of two new conventional stocks – a new medium 5% Treasury Stock 2012 and a new long 5% Treasury Stock 2025.

In January 2001, before the remit was finalised, the Economic Secretary chaired consultation meetings with gilts market participants. These meetings indicated strong support for the issuance of a new medium maturity conventional gilt (the planned medium issuance in 2000-01 having been cancelled as a consequence of the receipts from the auction of the 3G mobile phone spectrum licences). Market participants also argued for continued long conventional issuance and further index-linked issuance (particularly given the redemption of $2^1/_2$% Index-linked Treasury Stock 2001).

The subsequent DMO Quarterly consultation meeting in March, ahead of the announcement of the gilt operations for April-June 2001, revealed strong support for a new 2012 maturity gilt, which was subsequently first auctioned on 24 May 2001. The new stock was well received, with the auction covered 2.49 times and no yield tail.

On long conventional issuance, market sentiment was less clear cut with views divided between concentrating issuance in the 4¼% Treasury Stock 2032 and launching a new issue. In the event, a new 2025 maturity stock was first auctioned on 26 September 2001; this was seen as fulfilling a beneficial purpose in bridging the maturity gap between the 2021 and 2028 stocks. Again the stock was well received (despite the relative weakness of the long-end of the curve immediately after 11 September 2001). Having been issued, market participants looked for the stock to be built up quickly at the next conventional auction (in November 2001).

Issuance of index-linked stocks (only maturities of 2009 and longer were considered) tended to follow market demand and alternated between medium and longer maturities.

The results of the outright gilt auctions held in 2001-02 are shown in table 3.

Table 3
The results of outright gilt auctions 2001-02

Date	Stock	Amount auctioned (nom)	Cover	Average accepted price (AAP)	Yield at AAP	Tail (bp)*
25-Apr-01	2½% IL 2011	£400mn	1.92	£225.30	2.59%	na
24-May-01	5% 2012	£2,500mn	2.49	£98.81	5.15%	0
25-Jul-01	2½% IL 2024	£500mn	1.48	£182.05	2.29%	na
26-Sep-01	5% 2025	£2,500mn	2.01	£100.25	4.98%	1
24-Oct-01	2½% IL 2016	£425mn	2.63	£213.00	2.39%	na
6-Dec-01	5% 2025	£2,750mn	1.97	£104.93	4.65%	1
24-Jan-02	4⅛% IL 2030	£500mn	1.98	£176.35	2.23%	na
27-Mar-02	5% 2012	£2,250mn	3.26	£98.01	5.26%	0

**index-linked auctions are conducted on a uniform price basis*

Breakdown of gilt sales 2001-02

The breakdown by type of instrument and maturity of planned and actual gilt sales in 2001-02 is summarised in tables 4 and 5. All were in line with agreed remit tolerances. The impact of issuance under the 2001-02 remit on the gilts portfolio is covered in the portfolio section below.

Table 4
Gilt sales by type of instrument 2001-02 (cash amounts)

Type (£bn)	Original remit	Revised remit	Outturn
Short conventional	0.00	0.00	0.00
Medium conventional	4.75	4.75	4.67
Long conventional	5.00	5.50	5.39
Index-linked	3.75	3.75	3.60
	13.50	**14.00**	**13.66**

Table 5
Gilt sales by type of instrument 2001-02 (by proportion)

Type	Original remit		Outturn	
	% of total issuance	% of conventional	% of total issuance	% of conventional
Short conventional	0.0	0.0	0.0	0.0
Medium conventional	35.2	48.7	34.2	46.4
Long conventional	37.0	51.3	39.5	53.6
Index-linked	27.8	0.0	26.4	0.0

(Figures may not sum due to rounding).

Switch auctions

The DMO carried out only two switch auctions in 2001-02, including the UK's first ever index-linked switch auction. The results of the two auctions are shown in table 6 below.

Market consultation had indicated strong support for building up the new 2012 maturity conventional as quickly as possible; less than a month after the first auction, the DMO took the opportunity to hold a switch auction out of 8½% Treasury Stock 2007. The switch auction was intended as the first step in building up that new stock to benchmark status ahead of a subsequent conversion offer (see below). It successfully increased 5% Treasury Stock 2012 to £4.2 billion (nominal) and reduced 8½% Treasury Stock 2007 to £4.5 billion (nominal)[18].

The first (and to date only) index-linked switch auction was held on 19 July 2001. The DMO had previously consulted the market on the rationale for such auctions and published its conclusions on 10 May 2001. In line with the primary rationale behind such operations the auction was held to coincide with 2% Index-linked Treasury Stock 2006 dropping out of the FTSE over 5-year index-linked gilt index.

Table 6
Results of gilt switch auctions in 2001-02

Date	Source stock	Nominal switched	Destination stock	Nominal created	Average DP ratio*	Cover ratio
21-Jun-2001	8 1/2% 2007	£1,400mn	5% 2012	£1694mn	1.2098	2.61
29-Jul-2001	2% IL 2006	£500mn	2½% IL 2016	£561mn	1.1228	1.27

**dirty price ratio based on the average price of the destination stock.*

Conversion offer

Again in line with strong feedback from the consultation process about the need to establish the new 2012 stock as having benchmark status, the first conversion offer for two years was held in July 2001 from 9% Treasury Stock 2012 into 5% Treasury Stock 2012. The DMO announced the terms (£136.35 nominal of the destination stock for £100 nominal of the source) on 29 June 2001 and the offer closed on 19 July. The results of the offer are summarised in the table 7.

Table 7
Result of the gilt conversion offer in 2001-02

Date	Source stock	Nominal converted	Acceptances	Destination stock	Nominal created	Conversion ratio per £100 nominal
23-Jul-2001	9% 2012	£4,958mn	92%	5% 2012	£6,761mn	£136.35

The offer was successful: 5% Treasury Stock 2012 was increased in size to £10.98 billion (nominal) within two months of it first being issued and 9% Treasury Stock 2012 was reduced to rump status with £403 million nominal in issue.

Gilt redemptions

£17.8 billion of gilts in market hands redeemed in 2001-02; details are shown in table 8.

[18] The DMO has a policy of not reducing stocks below £4.5 billion by switch auction.

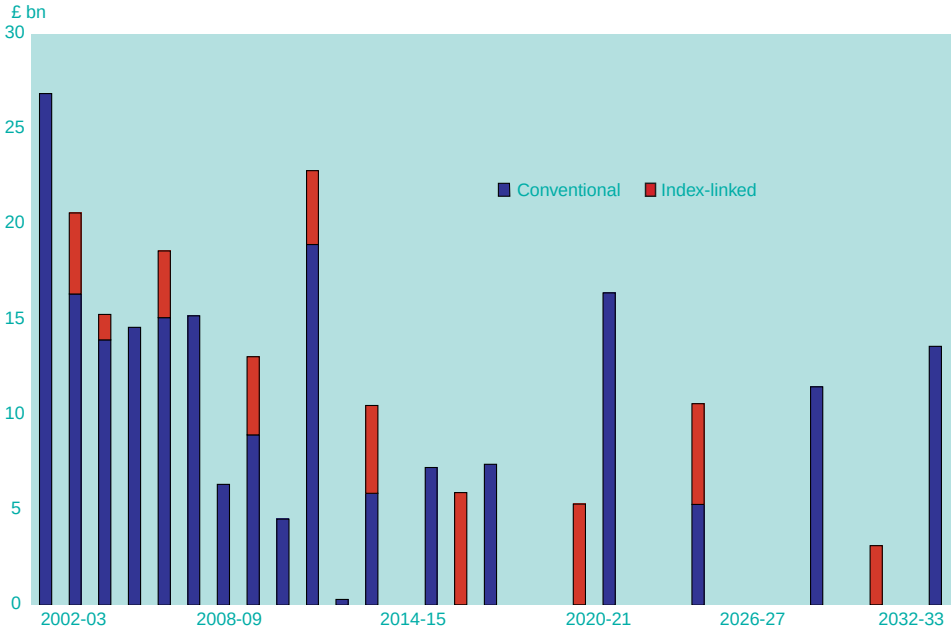
Table 8
Gilt redemptions 2001-02

Redemption date	Stock	Nominal Amount in issue £mn	Official holdings end-Mar 2001	Redemption amount* £mn
10-Jul-01	Floating Rate 2001	3,000	16	2,984
12-Jul-01	$9^1/_2$% 2001	3	3	0
10-Aug-01	$9^3/_4$% 2001	35	28	7
24-Sep-01	$2^1/_2$% IL 2001	2,150	179	3,071
6-Nov-01	7% 2001	12,750	1,039	11,711
		17,938	**1,265**	**17,773**

**Redemption amount for $2^1/_2$% IL 2001 includes a £1.1bn accrual adjustment*

The profile of future gilt redemptions as at end-March 2002 is as shown in chart 17 below.

Chart 17
Future gilt redemptions



Source: DMO

The gilt portfolio

The key statistics of the gilt portfolio at the end of March 2002 (compared to the position at the end of the previous financial year) are shown in table 9.

Table 9
The gilt portfolio: key statistics

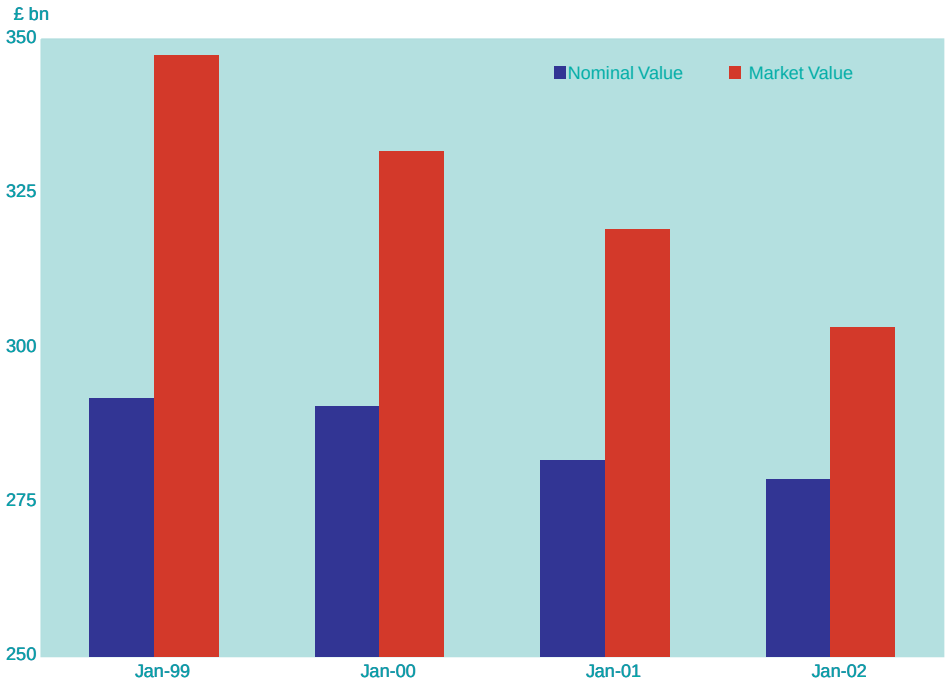
	31-Mar-2001	28-Mar-2002
Nominal value*	£281.80bn	278.72bn
Market value	£319.29bn	£303.32bn
Weighted average market yields:		
- Conventional gilts	4.85%	5.14%
- Index-linked gilts	2.46%	2.35%
Average maturity	11.01 years	11.00 years
Average modified duration	7.40 years	7.60 years
- Conventional gilts	6.77 years	6.56 years
- Index-linked gilts	10.48 years	10.65 years
Average coupon**	7.42%	7.20%

** including index-linked uplift*
*** of conventional, double-dated and undated gilts*

During the year the nominal value of the portfolio fell by £3.08 billion (1.1%) as redemptions exceeded new issuance. However the market value of the portfolio fell more sharply, by £15.97 billion (5.0%) as gilt prices fell (as evidenced by the rise in yields, see chart 1). The average maturity of the portfolio was virtually unchanged over the year, despite the weight of issuance at the medium and long maturities (reflecting the fact that the market value of longs fell more quickly than shorts), but the duration of conventional gilt portfolio fell slightly by 0.21 years. The average coupon on the portfolio (excluding index-linked gilts) continued to fall.

Falling nominal and market values of the portfolio have been a feature of recent years as shown in chart 18 below.

Chart 18
Nominal and market value of the gilts portfolio (1999-2002



Source: DMO

The breakdown of the nominal value of the gilt portfolio (including index-linked uplift) by maturity split at the end of March 2002 compared to a year earlier is shown in table 10.

Table 10
The gilt portfolio: breakdown by maturity

	30 March 2001	28 March 2002
Ultra-short (0-3 years)	22.6	23.3
Short (3-7 years)	24.5	19.9
Medium (7-15 years)	23.8	29.1
Long (15+ years)	28.0	26.6
Undated	1.1	1.1

Gilt remit and financing arithmetic 2002-03

The DMO's remit for 2002-03 was published by HM Treasury in the DRMR on 14 March 2002. This was a provisional remit to the extent that it was based on public finance projections published in the PBR on 27 November 2001. A provisional remit was published as Budget 2002 was held in April (rather than in March as usual), and under the Code for Fiscal Stability HM Treasury is required to publish its debt management plans before the start of each financial year. The DRMR looked forward to updated financing plans being published with the Budget on 17 April 2002.

On the basis of the PBR forecast for the 2002-03 CGNCR of £13.6 billion a net financing requirement of £32.3 billion was forecast to be financed by:

- **Gilt sales of £23.0 billion (cash) split as follows:**
  - short conventionals £5.5 billion
  - medium conventionals £5.5 billion
  - long conventionals £7.5 billion
  - index-linked gilts £4.5 billion

- **Short-term debt sales of £9.3 billion, split as follows:**
  - an increase in the Treasury bill stock of £4.3 billion to £14.0 billion; and
  - a run down of the DMO's net cash position of £5.0 billion to £2.7 billion.

The preliminary financing arithmetic published on 14 March 2002 is shown in table 11.

Table 11
The gilt financing arithmetic

The financing arthimetic (£ billions)	2001-02	2002-03
CGNCR forecast	**6.3**	**13.6**
Prefinancing forex debt	1.2	0.0
Gilt redemptions	17.8	17.2
Buy-backs	0.5	0.0
Financing Requirement	**25.8**	**30.8**
less		
National Savings and Investments	-0.2	-1.5
DMO cash deposit at Bank of England	0.3	0.0
Net Financing Requirement	**25.7**	**32.3**
Financed by:		
1. Planned gilts sales	**13.7**	**23.0**
of which:		
Short conventional	0.0	5.5
Medium conventional	4.7	5.5
Long conventional	5.4	7.5
Index-linked	3.7	4.5
2. Planned net short-term debt sales	**12.0**	**9.3**
of which:		
Change in Ways & Means	0.0	0.0
Change in T bill stock	6.4	4.3
Change in DMO net cash position*	5.6	5.0
Short term debt levels		
Ways & Means at end of FY	13.4	13.4
T bill stock at end of FY	9.7	14.0
DMO net cash position*	7.7	2.7

**excluding changes in the DMO's deposit at the Bank of England*
*** including the DMO cash deposit at the Bank of England*

The provisional remit included contingencies that could be implemented in the event that the Budget forecasts led to changes in the financing requirement. The DRMR indicated that the first contingencies to be considered would be:

- **In the event of a falling financing requirement:**
  - increasing the size of the DMO net cash position by up to £3.0 billion;
  - reducing planned long conventional issuance by up to £2.5 billion; and
  - reducing planned index-linked issuance by up to £0.75 billion.

- **In the event of a rising financing requirement:**
  - reducing the size of the DMO net cash position by up to £1.0 billion;
  - increasing planned short conventional issuance by up to £2.5 billion; and
  - increasing planned medium conventional issuance by up to £2.5 billion.

Budget 2002 revision to the 2002-03 remit

The Budget on 17 April 2002 included the outturn figure for the 2001-02 CGNCR and a new forecast for 2002-03 – these were (with the previous forecasts in brackets):

- 2001-02: £2.9 billion (£6.3 billion).
- 2002-03: £13.5 billion (£13.6 billion).

Over the financial years 2001-02 and 2002-03 the financing requirement fell by £3.6 billion compared to the forecasts published on 14 March.

In line with the published contingencies, £0.6 billion of this was taken account of by a reduction in long conventional gilt sales to £6.9 billion (cash) – taking total planned gilt sales to £22.4 billion (cash). The remainder (£3.0 billion) was taken account of by a reduction in the forecast level of the DMO's net cash position at end-March 2003 to £5.7 billion. This requires an increase of £0.4 billion in the planned run-down in 2002-03 to £5.4 billion (excluding the planned change in the deposit at the Bank of England, see below) from its realised level of £11.0 billion at end-March 2002 (compared to £7.7 billion forecast on 14 March 2002).

Two other factors also affected the restatement of the financing arithmetic on 17 April:

- a slightly higher level of debt buy-backs (£0.6 billion as opposed to £0.5 billion); and
- a slightly higher run-down of DMO's cash deposit at the Bank of England (£0.4 billion as opposed to £0.3 billion).[19]

The revised financing arithmetic is shown in table 12.

[19] The DMO's cash deposit at the Bank of England is targeted to be £200 million. It ended the 2000-01 financial year at £0.5 billion and the financing arithmetic for 2001-02 assumed it would be run down by £0.3 billion to return it to the target level. The outturn on 28 March rounded to £0.1 billion.

Table 12
The gilt financing as revised in Budget 2002

The financing arthimetic (£ billions)	2001-02	2002-03
CGNCR forecast	**2.9**	**13.5**
Prefinancing forex debt	1.2	0.0
Gilt redemptions	17.8	17.0
Buy-backs	0.6	0.0
Financing Requirement	**22.5**	**30.5**
less		
National Savings and Investments	-0.2	-1.5
DMO cash deposit at Bank of England	0.4	0.1
Net Financing Requirement	**22.3**	**32.1**
Financed by:		
1. Planned gilts sales	**13.7**	**22.4**
of which:		
Short conventional	0.0	5.5
Medium conventional	4.7	5.5
Long conventional	5.4	6.9
Index-linked	3.6	4.5
2. Planned net short-term debt sales	**8.6**	**9.7**
of which:		
Change in Ways & Means	0.0	0.0
Change in T bill stock	6.4	4.3
Change in DMO net cash position*	2.2	5.4
Short term debt levels		
Ways & Means at end of FY	13.4	13.4
T bill stock at end of FY	9.7	14.0
DMO net cash position*	11.0	5.7

**excluding changes in the DMO's deposit at the Bank of England*
*** including the DMO cash deposit at the Bank of England*

The gilt auction calendar for 2002-03

The gilt sales target of £22.4 billion is to be achieved by a programme of 12 outright gilt auctions: 7 conventional (2 short, 2 medium and 3 long maturity) and 5 index-linked. The auction calendar (including issuance decisions announced at the end of September 2002) is shown in table 13.

Table 13
The gilt auction calendar 2002-03

Date		Stock/Type
Wednesday	24 April 2002	$2^1/_2$% Index-linked Stock 2020
Wednesday	29 May 2002	5% Treasury Stock 2025
Tuesday	25 June 2002	5% Treasury Stock 2008
Wednesday	10 July 2002	2% Index-linked Stock 2035
Wednesday	24 July 2002	5% Treasury Stock 2014
Wednesday	25 September 2002	2% Index-linked Stock 2035
Tuesday	22 October 2002	5% Treasury Stock 2014
Thursday	24 October 2002*	$2^1/_2$% Index-linked Stock 2013
Wednesday	27 November 2002*	5% Treasury Stock 2025
Wednesday	22 January 2003	Index-linked Stock
Wednesday	26 February 2003*	Conventional Stock
Wednesday	26 March 2003*	Conventional Stock

**Subject to confirmation following the Chancellor's decisions on the Budgetary timetable*

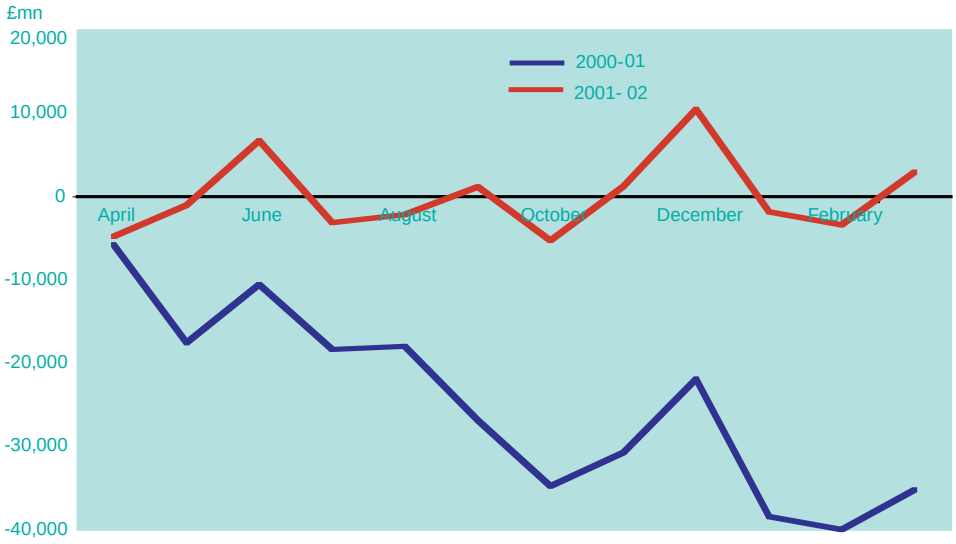
Chapter 4: The cash management remit

The DMO's remit for its second year of cash management operations was published on 7 March 2001. The remit was fundamentally similar to the first year's with the key development being a planned increase in the stock of Treasury bills of £3.5 billion to £8.5 billion by end-March 2002. However, unlike in 2000-01, this planned increase in the Treasury bill stock was implemented; indeed in the PBR on 27 November 2001 the planned end-financial year stock was increased to £9.7 billion. This target was met.

The main development in 2001-02 that required the increase in the Treasury bill stock was a return of Exchequer cash flows to their more usual seasonal pattern of tax receipts and expenditures. The cumulative monthly CGNCRs for 2000-01 and 2001-02 are shown in chart 19. The chart clearly shows how unusual 2000-01 was, with distortion caused by the proceeds from the sale of the 3G mobile phone spectrum licences.

The cumulative CGNCR for 2001-02 was, as discussed in chapter 3, £2.9 billion. While gilt sales and net short-term debt sales provide the necessary financing to meet that cash requirement, there are periods intra-year when the timing of particular cash flows requires the Exchequer to raise additional financing on a short-term basis. This is the role of cash management.

Chart 19
Cumulative CGNCRs 2000-01 and 2001-02



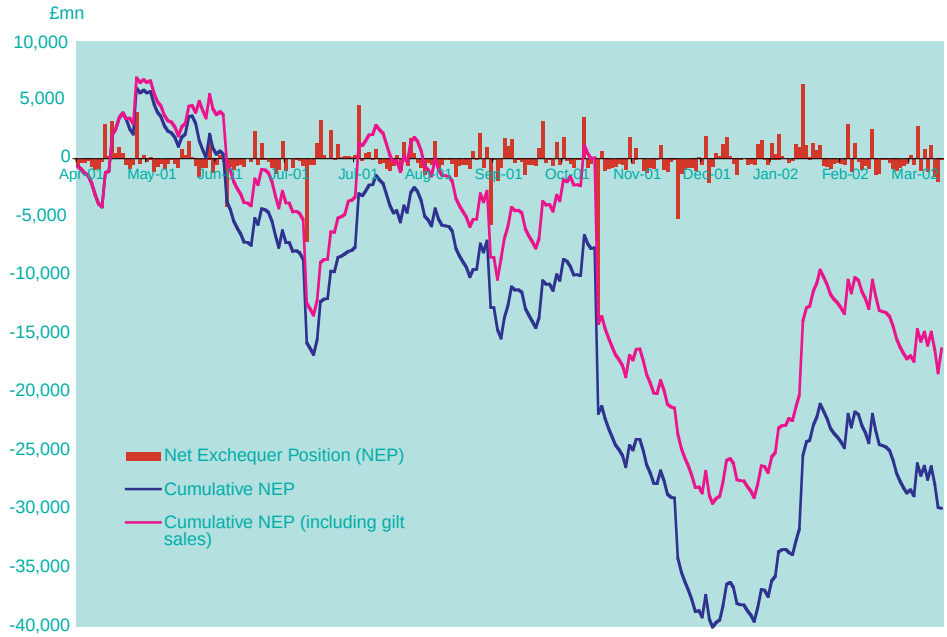
Source: HM Trreasury

The scale of cash flows that need to be managed on a daily basis and the cumulative net Exchequer position (NEP) in 2001-02 is shown in chart 20[20]. The impact of gilt sales on the financing need is also shown. The DMO managed these flows (into and out of the National Loans Fund) primarily through the use of bilateral operations in the secured markets (although Treasury bills played an increasingly important role (see below)). The DMO successfully managed to keep a small positive end-of-day balance at the Bank of England. (A £0.2 billion balance is held at

[20] The net Exchequer position is similar to the CGNCR but additionally takes account of gilt redemptions and some other miscellaneous items.

the Bank of England as a source of operational flexibility to manage unanticipated cash flows that emerge late in the banking day. In 2000-01 there were only two occasions when the £0.2 billion balance was exhausted; there were no such occasions in 2001-02).

Chart 20
Daily net Exchequer position 2001-02



Source: HM Treasury/DMO

As in the previous year, the DMO continued to manage a short-term net cash position (identified in the financing tables 2, 11 and 12) as an extension of its cash management operations (see also the DRMR of March 2002, published by HM Treasury). The cash position ended the 2001-02 financial year at £11.0 billion and it is expected to be run-down to £5.7 billion at the end of 2002-03. Assets managed in line with a remit from HM Treasury accounted for a significant part of this. The management of these assets was monitored and reported regularly to HM Treasury with reference to a benchmark. The DMO invested the cash in accordance with its remit.[21]

Treasury bills

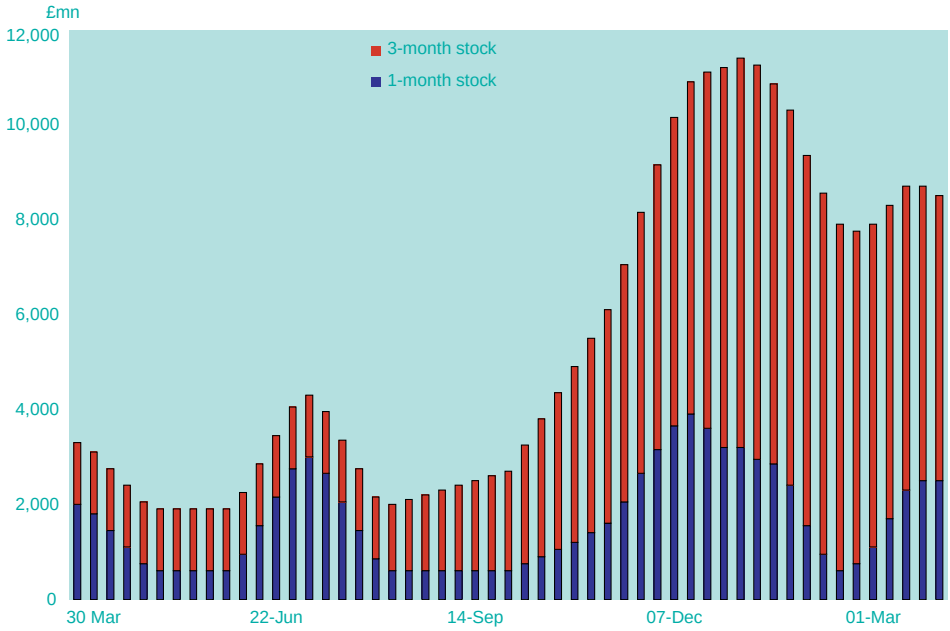
The DMO began the 2001-02 financial year with an outstanding Treasury bill stock of £3.3 billion comprising £2.0 billion 1-month bills and £1.3 billion 3-month bills. Stocks averaged only £2.6 billion in the first half of the financial year, although peaking at £4.3 billion in July, a period when the cumulative NEP was showing a significant shortfall.

From September 2001 onwards the stock began rising strongly as issuance was stepped up ahead of the seasonal net Exchequer outflows towards the end of the calendar year. Weekly issuance of 1-month bills was increased from £0.15 billion to a maximum of £1.0 billion and 3-month issuance was increased from £0.1 billion to £0.7 billion. The stock peaked at £11.4 billion in early January 2002 and fell thereafter during a period of Exchequer cash surplus. The stock ended the financial year at the remit target level of £9.7 billion, an increase of £6.4 billion over the year. The profile of Treasury bill stocks in 2001-02 is shown in chart 21.

---

[21] The benchmark and remit are necessarily commercially confidential.

Chart 21
Treasury bill stocks 2001-02



Source: DMO

The results of the weekly Treasury bill tenders are shown in Annex C and a comparison of the yields achieved at the tenders with prevailing market funding rates can be found in Chapter 6. The results in Chapter 6 indicate that Treasury bills have provided a cost effective means of managing the Exchequer cash flow requirements, insofar as the average yield at Treasury bill tenders has been slightly below comparable gilt GC rates.

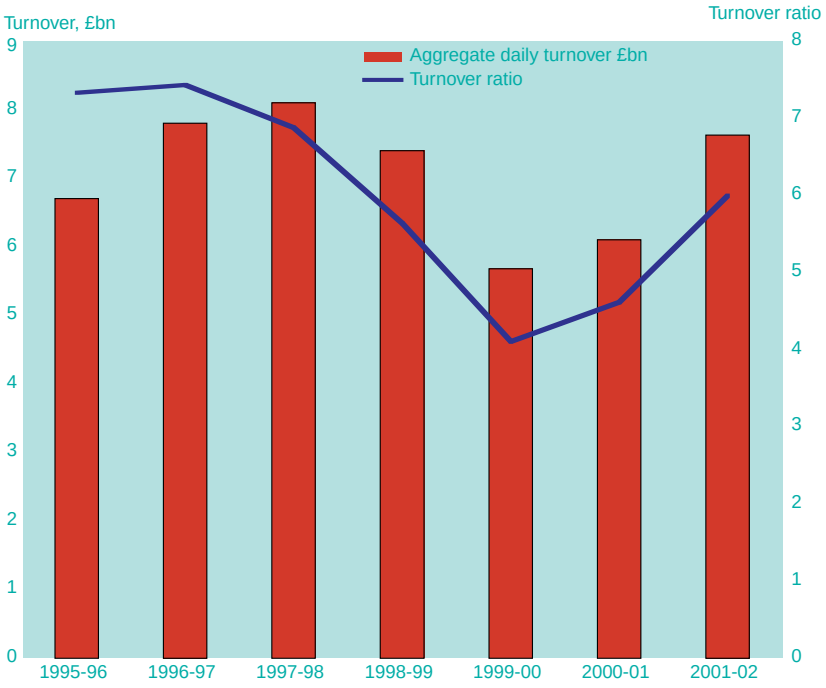
No ad hoc tenders or ad hoc reverse repo tenders were held in 2001-02.

Chapter 5: Other market developments

Gilts market turnover

Activity in the gilts market increased significantly in 2001-02 compared with the previous year – with average daily turnover at its highest level since 1997-98 (see chart 22). Average daily turnover as reported by the GEMMs increased by 25% from £6.10 billion to £7.63 billion. Trading intensity (as measured by the turnover ratio[22]) rose even more markedly by 30% from 4.61 to 6.00, although this partially reflected the impact of a decline in the market value of the gilt portfolio between the end of March 2000 and 2001[23]. The increase in turnover can probably be attributed to greater levels of government and corporate primary issuance, a flight to quality associated with equity market weakness and volatility, and, in the early part of the year, declining interest rates

Chart 22
Aggregate daily turnover in gilts and the turnover ratio



Source: GEMMs

Turnover was slightly more evenly spread across maturities than in the previous year, with the medium maturity sectors (7-10 and 10-15 years) better represented than in 2000-01, reflecting the launch of a new medium maturity benchmark stock 5% 2012 (and the reduced impact of MFR driven investment in longs). However, turnover in longer-dated maturities remained the most highly traded sector reflecting continued demand from pension and insurance companies. See chart 23.

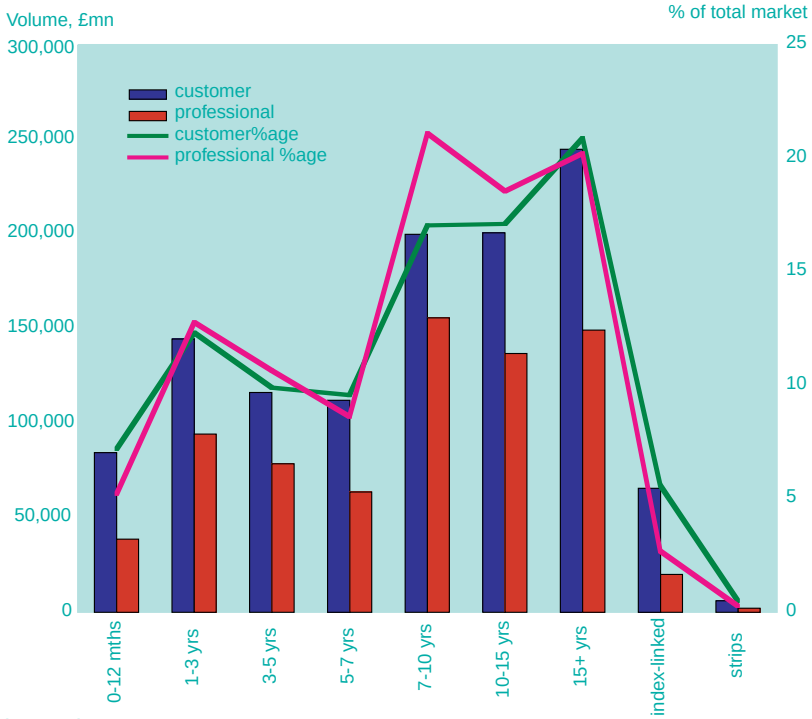
In line with the increase seen in average daily activity, average weekly turnover of gilt trades executed through the GEMMs in 2001-02 was also up sharply to £36.8 billion compared with £29.6 billion in 2000-01, with client (customer) business accounting for 61% of turnover (see chart 24). Turnover was fairly constant

---

[22] The turnover ratio equals the aggregate turnover relative to the market value of the portfolio at the beginning of the financial year.

[23] From £331.9 to £319.3 billion.

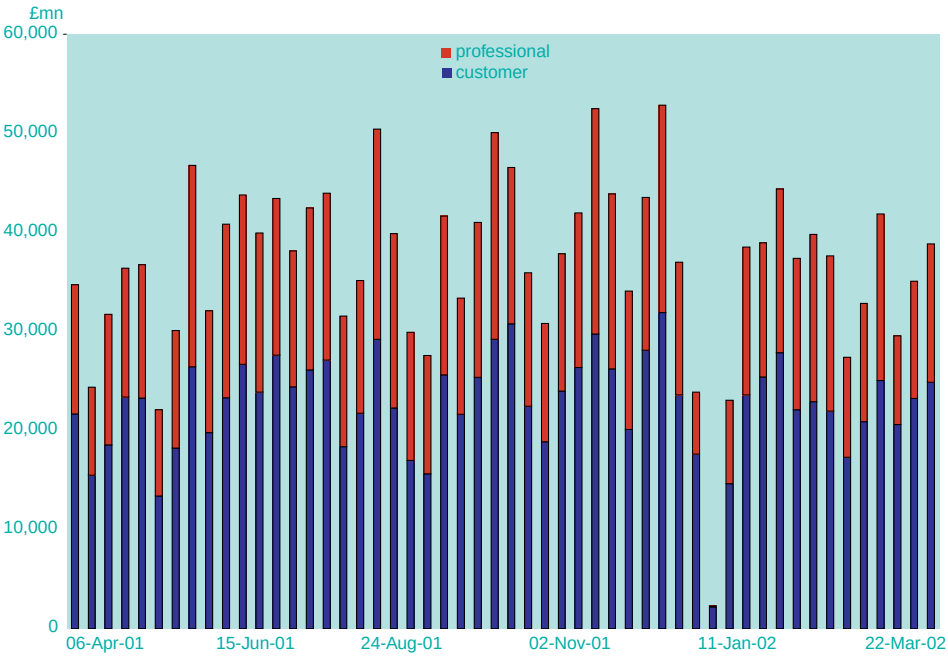
Chart 23
GEMM weekly turnover in gilts by maturity band



Source: GEMMs

throughout the year averaging £37.2 billion a week in the first half of the financial year and £36.5 billion in the second. Weekly turnover by GEMMs is published in the DMO's Quarterly Review and on the DMO web site on a quarterly basis.

Chart 24
GEMM weekly turnover in gilts by maturity band



Source: GEMMs

New arrangements for Treasury bill issuance

On 21 September 2001, as part of the preparations for significantly increasing the level of Treasury bill stocks from October onwards (see chapter 4), the DMO

announced new arrangements for Treasury bill issuance. The main operational changes which came into effect from tenders on 5 October 2001 were:

- all bids to be received by 11.00 am on the day of the tender (previously 12.30 pm);
- all bids to be made (on a money market yield basis) to three decimal places (previously two decimal places);
- bids at tenders to be for a minimum of £500,000 nominal of bills (previously £1 million); and
- the minimum issuance denomination of Treasury bills to be £25,000 (previously £5,000).

The DMO also announced that a group of nine banks had agreed to act as primary participants in connection with the issuance of Treasury bills.[24] Primary participants will, subject to their own due diligence, bid on behalf of other investors at tenders and have also agreed to provide secondary dealing prices for Treasury bills for their customers.

Cash management handbook

On 20 February 2002 the DMO published its cash management handbook, "Exchequer Cash Management in the United Kingdom", describing the DMO's approach to cash management and its operations in the recent past. This includes all documentation (including the Cash Management Operational Notice) relevant to its Exchequer cash management activities. It was designed to be useful to practitioners, as a reference, and also to a wider interested audience. It also fulfilled the undertaking the DMO gave to the Treasury Sub-committee to produce such a document following a recommendation in the Treasury Sub-Committee's report into the Government's Cash and Debt Management in 2000.

DMO secondary market index-linked gilt bidding facility

On 22 November 2001 the DMO published an updated gilts market operational notice, the main feature of which was the withdrawal of the facility whereby the DMO had been prepared to bid market makers for index-linked stocks (2009 maturity and longer) on demand. This reflected a move by the DMO to bring its relationship with index-linked market participants more into line with that in conventional gilts. In place of the bidding facility a reverse tapping facility was introduced to mirror the existing tap facility - so that the DMO may now buy back and cancel stock for market management reasons only in conditions of extreme market dislocation.

Withdrawal of "debt buy-back" gilt bidding facility

On 13 December 2001 the DMO announced that it was withdrawing the facility whereby it had been prepared to bid GEMMs outright for specific stocks – index-linked gilts with 2003-06 maturities and non-rump double-dated gilts[25]. This facility had been introduced in 2000 as a means of increasing the net financing requirement at a time of reduced financing needs and supplemented debt buy-backs through reverse auctions. In the PBR on 27 November 2001 the DMO's debt buy-back target for 2001-02 was reduced from £1.0 billion to £0.5 billion. The facility was withdrawn after the revised target was reached.

Operation of the DMO's standing repo facility

In June 2000 the DMO introduced a non-discretionary standing repo facility, whereby the DMO may temporarily create, on request and for the purpose of managing actual or potential dislocations in the gilt repo or underlying gilts market, a gilt for repo. The

[24] Barclays Bank plc, Cater Allen International Ltd, Credit Lyonnais, Deutsche Bank, Halifax Group Treasury & Wholesale Banking, JP Morgan Securities Ltd, The Royal Bank of Scotland plc, Salomon Brothers International Ltd, UBS Warburg.

[25] 8% Treasury Stock 2002-06, $3^1/_2$% Funding 1999-2004, $5^1/_2$% Treasury Stock 2008-12 and $7^3/_4$% Treasury Stock 2012-15.

facility was used 15 times in 2001-02, nine of which occurred between 28 September and 17 October 2001 (all involving the creation of 6¼% Treasury Stock 2010). The largest amount of stock created under this facility was £850 million of 9% Conversion Stock 2011 on 19 February 2002. The DMO charges an overnight penal rate and takes general collateral at the Bank of England's repo rate against the stock lent. In 2001-02 each issue of stock was cancelled on the following business day.

EU Savings Directive: preserving gilt fungibilty

On 1 March 2002 HM Treasury issued to the DMO additional amounts of each gilt-edged stock. The issues were made so that all gilts, irrespective of when they were originally issued fell within the terms of the draft EU Savings Directive as set out in Article 15. The overall nominal total issued was £691.0 million with the increase in size of each gilt ranging from £0.25 million to £30.0 million for conventionals and from £5.0 million to £15.0 million for index-linked gilts. The amounts were chosen to have a negligible effect on relevant indices.

The additional amounts of stock are held on the Debt Management Account by the DMO for use as collateral in its cash management operations. This possibility was foreshadowed in the DMO's remit. For the first six months the new issues were used only in Delivery-By-Value (DBV) transactions.

To ensure fungibility of STRIPS on 1 March 2002 the DMO also stripped and then reconstituted a nominal amount of each of the strippable bonds issued under this operation.

Development of the gilts strips market

The official gilts strips facility was launched on 8 December 1997. Experience from other strips markets had shown that the efficiency and liquidity of the market would be greater if the underlying strippable bonds were large liquid issues. In view of this, for some time in advance of the introduction of the strips market the Bank of England (as debt manager at the time) concentrated conventional gilt issuance in strippable benchmark issues. As a result, by 8 December 1997 there were 7 strippable bonds in

Table 14
Strippable gilts at end-March 2002*

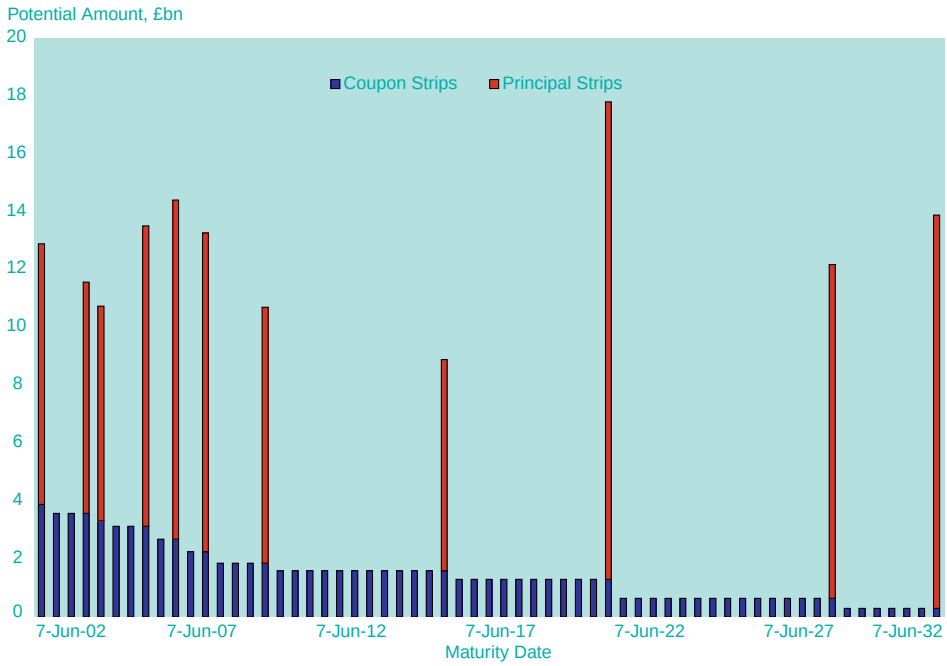
	Nominal amount in issue at end-March 2002 (£mn)	Nominal Amount held in stripped form at end-March 2002 (£mn)	Percentage held in stripped form at end-March 2002 (%)
Gilt			
7% Treasury 2002	9,012	94	1.0%
6½% Treasury 2003	8,002	50	0.6%
5% Treasury 2004	7,423	10	0.1%
8½% Treasury 2005	10,396	138	1.3%
7½% Treasury 2006	11,721	215	1.8%
7¼% Treasury 2007	11,022	97	0.9%
5¾% Treasury 2009	8,856	21	0.2%
8% Treasury 2015	7,300	364	5.0%
8% Treasury 2021	16,507	291	1.8%
6% Treasury 2028	11,537	113	1.0%
4¼% Treasury 2032	13,601	40	0.3%
Total	**115,377**	**1,433**	**1.2%**

Source: DMO
**On 21 December 2001 the DMO announced that both 5% Treasury Stock 2012 and 5% Treasury Stock 2025 would become strippable on 2 April 2002.*

issue, with a total amount outstanding of just over £80 billion in nominal terms, representing almost 30% of the gilts market. These bonds all had aligned coupon dates of 7 June and 7 December in order to facilitate coupon strip fungibility. After the transfer of debt management operations to the DMO the pool of strippable bonds with 7 June / 7 December coupon dates continued to be built up and by the end of March 2002 there were 11 strippable bonds accounting for 41% of the gilts portfolio. See table 14.

Chart 25 illustrates the maximum potential size of each coupon and principal strip on this date. Despite the large pool of bonds eligible for stripping, the market in gilt strips has grown slowly and by March 2002 only 1.2% of strippable bonds were held in stripped form.

Chart 25
Potential strip cash flows at end-March 2002



Source: DMO

Introduction of new strippable coupon dates

With almost half of all gilts having 7 June / 7 December coupon dates the DMO decided to seek views from the market on whether it was time to introduce a second set of coupon dates.

At the March 2001 GEMM and end-investor consultation meetings there was widespread support for a move to a new set of coupon dates (with 7 March / 7 September being the favoured dates). The introduction of a new set of dates was viewed as potentially attractive as it should assist the DMO in its cash management operations as well as providing investors with greater flexibility to match the cash flow profile of their liabilities.

Accordingly the first new stock issued under the 2001-02 remit, 5% Treasury Stock 2012, first issued on 25 May 2001, had coupon dates of 7 March and 7 September although it was not immediately strippable. A second new stock with 7 March and 7 September coupons, 5% Treasury Stock 2025 was first issued on 27 September 2001. Again it was not made strippable immediately but, when announcing the

details of the auction on 18 September 2002, the DMO said it would give at least three months notice of the stock becoming strippable.

On 21 December 2001 the DMO announced that both 5% Treasury Stock 2012 and 5% Treasury Stock 2025 would become strippable with effect from 2 April 2002.

By the end of the 2001-02 financial year the amounts outstanding of the two new (about-to-become) strippable stocks had reached £18.564 billion (nominal) as follows:

- 5% Treasury Stock 2012 £13.285 billion
- 5% Treasury Stock 2025 £ 5.279 billion

Index-linked gilt switch auctions

On 12 March 2001 the DMO published a consultation document on the conduct of index-linked switch auctions. The primary rationale behind such auctions was to provide a mechanism for index-trackers to switch out of a stock as it fell out of the relevant maturity range in a key index. On 10 May 2001 the DMO published its response. Reactions had been generally supportive of the proposed structure. Accordingly, the first (and to-date only) index-linked switch auction was held on 19 July 2001 from 2% Index-linked Treasury Stock 2006 into $2^{1}/_{2}$% Index-linked Treasury Stock 2016 (see chapter 3).

Index-linked re-design

In March 2001 the DMO announced that it would consult gilts market participants during 2001-02 on whether to adopt a new design for new issues of index-linked gilts. The main reason for deciding to consult on this issue was that over the previous year some market participants had suggested that they would like the DMO to issue a new long maturity index-linked gilt; the last issue of a new index-linked gilt being in September 1992. Although up to that point such interest had been fairly limited, the DMO thought it advisable to revisit the design issue ahead of wider market interest in issuing a new bond in order to allow sufficient time to consult. The main reason for considering a re-design of index-linked gilts was that the recent growth in the international markets for index-linked securities had led to an increasing convergence to the instrument design pioneered by the Canadian authorities. This design offers a much shorter indexation lag than is currently employed in the UK and as a result, provides investors with better inflation protection.

The DMO published its consultation paper on index-linked gilt re-design on 7 September 2001 and the consultation period ended on 31 October 2001[26]. The responses were evenly split between those for and those against a complete re-design. This represented a much more positive response to the possibility of re-design than when it was last aired in 1998. However, in most cases, those that were opposed to re-design had serious reservations over the introduction of a new design (citing for example liquidity concerns arising from possible market fragmentation). Having received no clear mandate from the market to proceed with the introduction of a new design of index-linked gilt the DMO decided not to undertake a full re-design. Instead, the DMO decided to retain the current design for future new index-linked issues, albeit with some minor changes (as outlined below).

---

[26] Both the consultation paper and the response document are available on the DMO web site at: www.dmo.gov.uk/gilts/public/consdoc/cons070901.pdf and www.dmo.gov.uk/gilts/public/consdoc/cons150102.pdf respectively.

Any new index-linked bond will be issued with the following new features:

- New index-linked gilts will have a different prospectus indexation clause from other index-linked gilts. The clauses in the prospectuses for other bonds allow for the possible early redemption of index-linked stock should there be a change in the RPI that is considered to be materially detrimental to bondholders. A trigger of the early redemption clause would clearly be disruptive to the index-linked gilts market, and other major markets operate perfectly well without such clauses. The new prospectus will bring the UK into line with the approach used in other major markets. Instead of making provision for early redemption of stock affected by an index change it places the onus on an independent institution to propose a satisfactory replacement index should the RPI cease to exist.
- Whilst the Bank of England (as the former Government debt manager) retains the responsibility for fixing the coupon and redemption payments for other index-linked gilts, the cash flows on any new index-linked gilts will be set by the DMO. (As a reflection of this change the DMO took over the Index-linked Gilt Helpline from the Bank of England on 5 August 2002. Those with queries on the calculation or value of index-linked gilt cash flows should contact the DMO on 020 7862 6500).
- The precision of the coupon and redemption payments for all new index-linked gilt will be increased. Whereas the cash flows for other index-linked gilts are rounded down to either 2 or 4 decimal places, for any new index-linked gilts they will be calculated by nearest rounding to 6 decimal places.

A new index-linked gilt, 2% Index-linked Treasury Stock 2035, was subsequently auctioned on 10 July 2002 with the above new features.

Improvements to the DMO Web Site - www.dmo.gov.uk

Over the past year a significant amount of development work has been carried out on the DMO web site. Regular users of the web site will already be familiar with the new format to the site that was introduced in September 2001. The new homepage (below) features drop down menus to assist navigation round the site. In addition to these aesthetic changes the DMO has continued to expand the material available on the web site in order to ensure that it remains an accurate reflection of the DMO's business activities.

The following list gives an indication of some of the information available on the web site:

- Background information on the DMO including its strategic objectives and performance targets, as well as the current (and previous) Business Plan and Annual Report & Accounts - www.dmo.gov.uk/bginfo/f1index.htm;

- A dedicated remit section which includes the cash and gilt remits and details of the financing arithmetic - www.dmo.gov.uk/remit/f1remit.htm;

- A What's New section detailing press notices and publications issued by the DMO over the preceding three months - www.dmo.gov.uk/news/f1news.htm;

- All cash and gilts press notices, as well as significant screen announcements - www.dmo.gov.uk/cash/press/f2press.htm and www.dmo.gov.uk/gilts/press/f2press.htm respectively;

- Contact details for all Gilt-Edged Market Makers (GEMMs) and Treasury bill primary participants - www.dmo.gov.uk/gilts/gemms/f2gemms.htm and www.dmo.gov.uk/cash/part.htm respectively;

- Results of cash and gilts operations including Treasury bill tenders, and outright, switch and reverse gilt auctions
  see www.dmo.gov.uk/gilts/operations/f2ops.htm for gilts operations;
  see www.dmo.gov.uk/cash/results/f2tend.htm for cash operations;

- A section for the retail investor, which provides an explanation of the different types of gilt, gives links to some useful web sites and provides an electronic version of the retail investor's guide to gilts
  - www.dmo.gov.uk/gilts/retail/f2ret.htm;

- Information on the FTSE gilt indices, including a hyperlink to FTSE's Ground Rules which set out how these indices are constructed - www.dmo.gov.uk/gilts/indexlink/uk/igind.htm;

- An issuance calendar detailing all the scheduled outright gilt auctions for the current financial year - www.dmo.gov.uk/gilts/issuance/f2isu.htm;

- A Question and Answer section providing answers to some of the most frequently asked questions about gilts and gilt issuance
  - www.dmo.gov.uk/gilts/q&a/fr2qa.htm;

- A dedicated section on index-linked gilts providing information about the UK market as well as details on other inflation-indexed bond markets - www.dmo.gov.uk/gilts/indexlink/uk/f3uk.htm;

- A publication section which features DMO publications such as the Annual and Quarterly Reviews, the wholesale and retail guides to the gilts market and DMO market consultation and response documents
  - www.dmo.gov.uk/publication/f1pub.htm;

- The section of the web site that has undergone the biggest expansion is the part of the site providing data on the gilts market. In addition to details on all gilts currently in issue this section provides historic data including statistics on the size of the gilts market, the composition of the gilts portfolio, holding period returns and market turnover - www.dmo.gov.uk/gilts/data/f2dat.htm;

- Since April 2001 the DMO has been publishing daily prices and yields on all gilts on the web site. These are based on data provided each evening by members of the Gilt-edged Market Makers Association (GEMMA). As the data are stored as html files it is straightforward for users of the site to load them into Excel for analysis. The GEMMA reference prices screen is shown below - www.dmo.gov.uk/gilts/data/f3gem.htm. GEMMA reference prices for the period from 12 July 1996 (when GEMMA prices began) to March 2001 are available on CD-ROM on request from the DMO;

- Hyperlinks to the web sites of domestic financial institutions such as the London Stock Exchange, LIFFE, the Bank of England and all gilt-edged market makers. Also, links to the web sites of international debt issuers and central banks - see www.dmo.gov.uk/gilts/links/f2gem.htm and www.dmo.gov.uk/gilts/links/f2oth.htm;

- A recruitment section detailing current (and recent) job opportunities at the DMO - www.dmo.gov.uk/recruit/f2off.htm;

The DMO is committed to an ongoing programme of development of its web site and as such would appreciate suggestions for material to add to the site. These ideas should be e-mailed to: mark.deacon@dmo.gsi.gov.uk

Chapter 6: Performance indicators

Gilt issuance counterfactuals

Following an earlier discussion in the Treasury Sub-Committee's report into the Government's Cash and Debt Management of 2000, last year's Annual Review included a comparison of the results achieved at gilt auctions (in terms of yield) with a number of counterfactuals. This analysis has been updated to cover operations in 2001-02. The current form of issuance counterfactual measurement is designed to indicate whether different non-discretionary patterns of issuance during the year might have resulted in higher or lower costs of financing. In measuring actual issuance against a counterfactual it must be borne in mind that much of the DMO's operations are constrained by its annual remit. The other key shortcoming of this approach is that it assumes prices and yields are supply inelastic.

The weighted average yield of issuance at the eight auctions over the financial year (weighted by cash raised) was 5.094%. See table 15.

Table 15
Weighted average actual gilt issurance[27]

Conventional issurance actual		
Date	**Cash £mn**	**Yield %**
24-May	2,469.1	5.15
26-Sep	2,504.1	4.98
6-Dec	2,884.3	4.65
27-Mar	2,201.0	5.26
	10,058.5	**4.988**
Index-linked issuance actual		
Date	**Cash raised £mn**	**Real yield %**
25-Apr	901.0	2.59
25-Jul	910.0	2.29
24-Oct	904.9	2.39
24-Jan	881.5	2.23
	3,597.4	**2.376**
Equivalent nominal yield*		**5.389**
Combined issuance actual		
Conventional	10,058.5	4.988
Index-linked	3597.4	5.389
All	**13,655.9**	**5.094**

** assuming 3% inflation.*

The actual yield achieved is compared with two counterfactuals in table 16 below. Under both counterfactuals, conventional issuance is assumed to have been split equally between three benchmark stocks - $7^1/_2$% Treasury Stock 2006, 5% Treasury Stock 2012 and $4^1/_4$% Treasury Stock 2032. The counterfactuals differ in their treatment of index-linked issuance as follows:

[27] Index-linked real yields assume 3% inflation throughout this publication.

- counterfactual 1 uses the actual weighted average of index-linked auction yields (i.e. it takes as given the actual yields achieved); and
- counterfactual 2 takes the average closing yields of all index-linked stocks eligible for auction (i.e. those with a maturity of 2009 or longer).

Table 16
Actual and counterfactual gilt issuance

Actual			
	Cash raised	**Real yield %**	**Nominal yield %**
Conventional	10,058.5		4.988
Index-linked	3,597.4	2.376	5.389
	13,655.9		5.094
Counterfactual 1			
	Cash raised	**Real yield %**	**Nominal yield %**
Conventional	10,058.5		4.883
Index-linked	3,597.4	2.376	5.389
	13,655.9		**5.017**
Counterfactual 2			
	Cash raised	**Real yield %**	**Nominal yield %**
Conventional	10,058.5		4.883
Index-linked	3,597.4	2.386	3.399
	13,655.9		**5.019**

Under counterfactual 1 the average yield would have been 5.017%; an out-performance of the counterfactual relative to actual of 7.7bp. This partially reflects the absence from actual issuance of $4^1/_4$% 2032 (the lowest yielding benchmark stock on the curve). Under counterfactual 2, substituting the average yield of all index-linked stocks with a maturity of 2009 or longer makes little difference – increasing the yield on the counterfactual by only 0.2bp.

Counterfactual gilt portfolio

Table 17 compares some key features of the actual gilt portfolio at 28 March 2002 under four hypothetical scenarios –

- no switch auctions took place;
- the conversion offer did not take place;
- no switch auctions or conversion offers took place; and
- the same nominal amount of stock was sold at each of the conventional auctions but split equally between $7^1/_2$% Treasury Stock 2006, 5% Treasury Stock 2012 and $4^1/_4$% Treasury Stock 2032. (The switch auctions and conversion offer are assumed to have happened under this scenario).

Table 17
Alternative gilt portfolios

GILT PORTFOLIO 28 MARCH 2002 (ALTERNATIVE SCENARIOS)				
	Nominal amount outstanding* (£mn)	**Market value (£mn)**	**Maturity (years)**	**Duration (years)**
Actual	**278.72**	**303.32**	**11.00**	**7.55**
No switch auctions	278.48	303.30	10.93	7.50
No conversion	276.92	303.15	11.01	7.54
No switch or donversion	276.68	303.13	10.94	7.49
Counterfactual**	278.69	303.42	10.91	7.48

**inc index-linked uplift **assuming actual index-linked issuance*

Unsurprisingly, given that the conversion ratio exceeded one, losing the conversion offer from the operations in 2001-02 would have made the largest impact on the nominal size of the portfolio. Without the conversion the portfolio would have been some £2 billion smaller. In contrast the switch auction impacted most directly on the maturity of the portfolio as stock was switched 10 years further down the curve. The counterfactual issuance scenario has little impact on the size and value of the portfolio but lowers the maturity and duration, involving as it does an assumed 33% of short issuance that was entirely absent from actual issuance.

Treasury bill issuance

Chapter 4 covers the DMO's Treasury bill issuance programme. The results of weekly Treasury bill tenders are documented at Annex C. This section measures the performance of the tender programme by comparing the yields achieved with market equivalent funding rates; the BBA GC repo rate and the LIBOR fixing on the day of settlement of the tender.

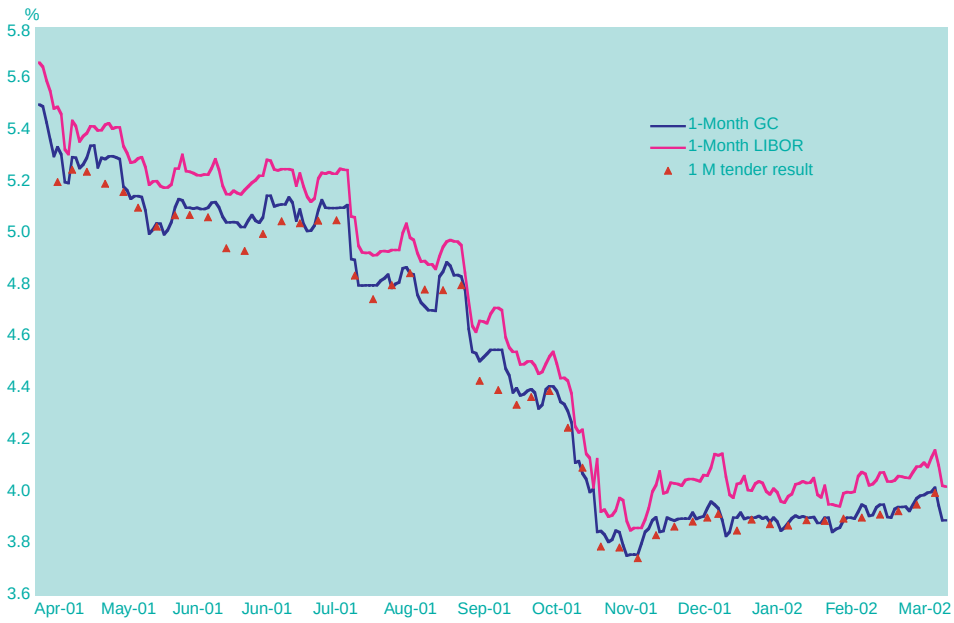
Table 18
Average tender yields relative to GC repo and LIBOR rates

	1 month	3 month
Average tender yield %	4.4675	4.4401
Average GC repo rate%*	4.5092	4.4751
Average LIBOR rate%*	4.6386	4.6380
Tender outperformance		
Against GC repo (basis points)	-4.17	-3.50
Against LIBOR (basis points)	-17.12	-19.79

**on tender settlement day*

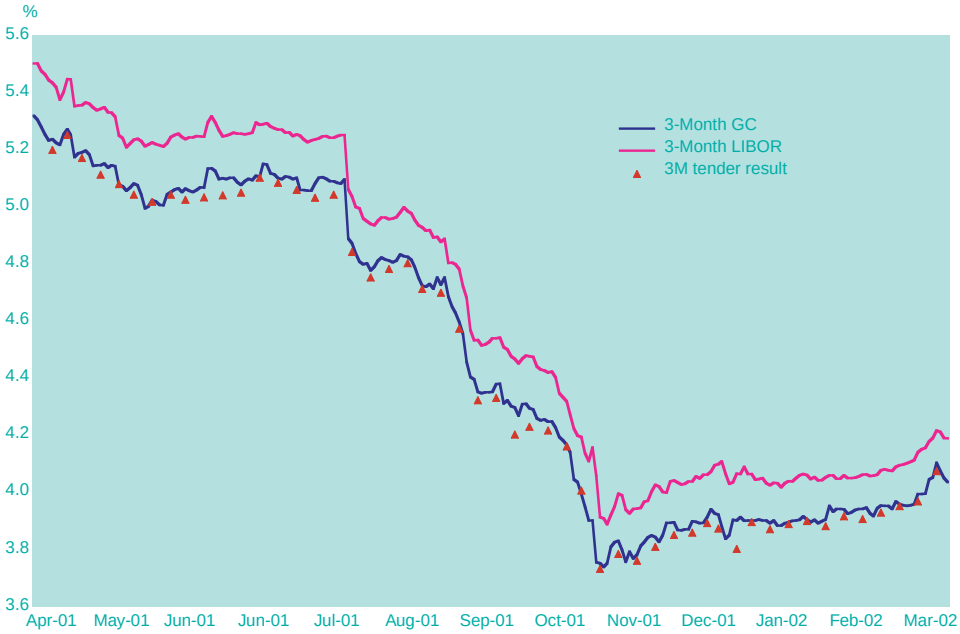
As shown in Table 18 and charts 26 and 27, over the year the rates achieved at tenders outperformed GC repo by 4.5bp (1-month) and 4.4bp (3-month), indicating that Treasury bills provided cost-effective financing relative to secured financing at the same maturity. Against LIBOR the extent of out-performance was greater at 17.1bp (1-month) and 19.8bp (3-month).

Chart 26
One-month Treasury bill tender yields compared to GC repo and LIBOR rates



Source: DMO

Chart 27
Three-month Treasury bill tender yields compared to GC and LIBOR



Source: DMO

Holding period returns

Last year's Annual Review compared the relative real holding period returns on different classes of gilts. This year's review looks more specifically at the change in real holding period returns over time and between the main classes of gilts.

The holding period return for a bond over a given time horizon is calculated as the percentage change in the dirty price over that period. This measure reflects the actual return received by an investor who bought and sold the gilt over a given

period, rather than the yield earned from holding a particular bond to its redemption. One slight complication when calculating a bond's holding period return is the need to add in any dividend payments received during the period over which the bond is held. Discounted dividend payments are added on the ex-dividend date to offset the effect on the dirty price of the bond going ex-dividend. The reported holding period returns do not incorporate any deductions for tax, nor do they assume that any coupons or principal received are reinvested[28].

The dataset used in this analysis was compiled by the Bank of England up to Q2 1996 and the DMO subsequently extended it up to Q4 2001[29]. The dataset covers the period from Q2 1970 for conventional bonds and from Q3 1982 for index-linked bonds (the first available observation given the date of their introduction) aggregated into the standard short, medium and long maturity categories. For each bond the daily holding period returns (monthly for the period from 1970 to 1978) were computed and these were then summed to give a non-overlapping quarterly holding period return series[30]. The quarterly holding period returns for each of the six classes of bond were then calculated as the average of the holding period returns of the bonds in each class[31]. Finally, the returns were converted into real holding period returns by subtracting quarterly inflation implied by the RPI. Bonds of small size or with outstanding part payments were excluded from this analysis.

Table 19 provides summary statistics for the annualised quarterly holding period returns between Q3 1982 to Q4 2001 for each of the six classes of gilt. Compared to last year's reported figures the addition of three quarters of new observations, combined with some minor revisions to the historic data set, has reduced the annualised mean real holding period returns by almost 90bp for conventional gilts and 73bp for index-linked gilts.[32] The volatility of returns, as measured by their annualised standard deviation, is largely unchanged from last year.

As is commonly observed in other developed financial markets, the unconditional mean of real holding period returns increases with maturity for both conventional and index-linked gilts. The volatility of returns also increases with bond maturity and, with the exception of short maturity conventional and index-linked bonds, is larger than the observed mean return.

Table 19

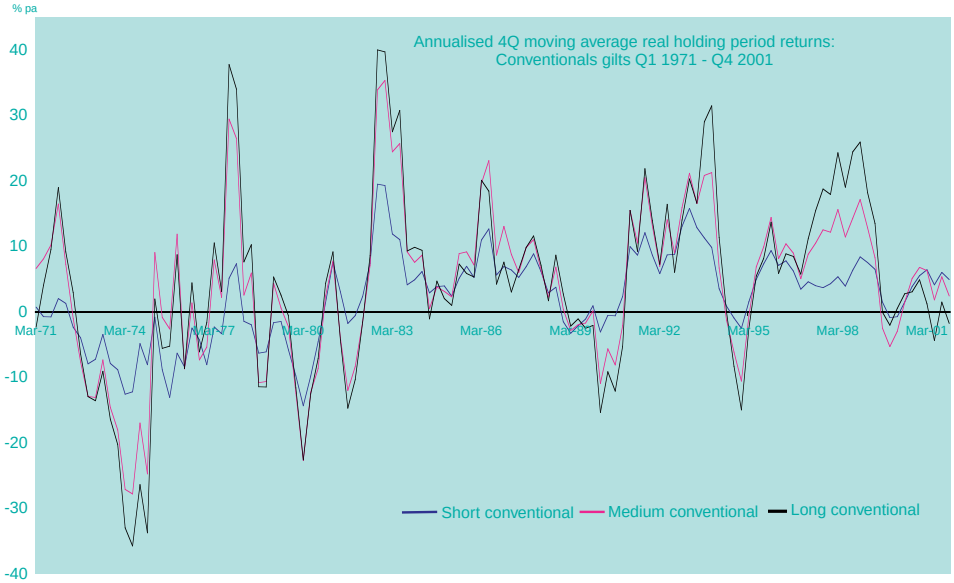
Class of bond	Annualised mean real HPR (%) (Q3 1982 - Q1 2001)	Annualised Standard Deviation of real HPR (%) (Q3 1982 - Q1 2001)
Short Conventional	5.38	4.15
Medium Conventional	7.72	8.70
Long Conventional	8.06	10.75
Average for conventional gilts	**7.06**	**7.87**
Short Index-linked	3.56	3.52
Medium Index-linked	4.14	6.59
Long Index-linked	4.06	8.14
Average for index-linked gilts	**3.92**	**6.09**

[28] See last year's Annual Review for a worked example for calculating a bond's holding period return.
[29] The DMO's quarterly holding period returns data set, which is updated periodically, is available on the web site as an html file, which can be downloaded into Excel.
[30] As the daily holding period returns are computed using the standard log approximation it is possible to estimate the quarterly holding period returns by simply adding the daily observations over the quarter.
[31] In order to remain consistent with the Bank of England's original data set the average is not weighted by the amounts outstanding of each stock.
[32] The correction of a minor error in a very limited number of historic observations has not substantively changed the aggregate results.

The above findings are broadly consistent with the expectations theory of the term structure of interest rates, which seeks to explain the relationship between interest rates of different maturities. In its simplest form, the theory implies that long-term interest rates reflect the average expected path of future short-term interest rates: i.e. long-term interest rates should be high relative to short-term rates when the interest rate is expected to rise and vice versa. On average you should therefore expect to earn about the same return on short- or long-term bonds at any horizon. However, the expectations theory is normally augmented to include a constant term-premium to reflect the fact that current forward rates differ from future spot rates. The term- premium reflects the compensation required by lenders for the added opportunity cost and uncertainty — about inflation or policy changes — that accompanies the maturity of the loan. A constant term-premium results in the commonly observed upward or 'normal' sloping yield curve as suggested by the data above.

Charts 28 and 29 compare the annualised rolling average of the previous four quarters real holding period returns of the different classes of gilts[33]. The graphs, along with table 19, clearly illustrate that real returns on index-linked gilts over the period 1982 to 2001 have been on average lower and proved less volatile than those on conventional gilts of a similar maturity.

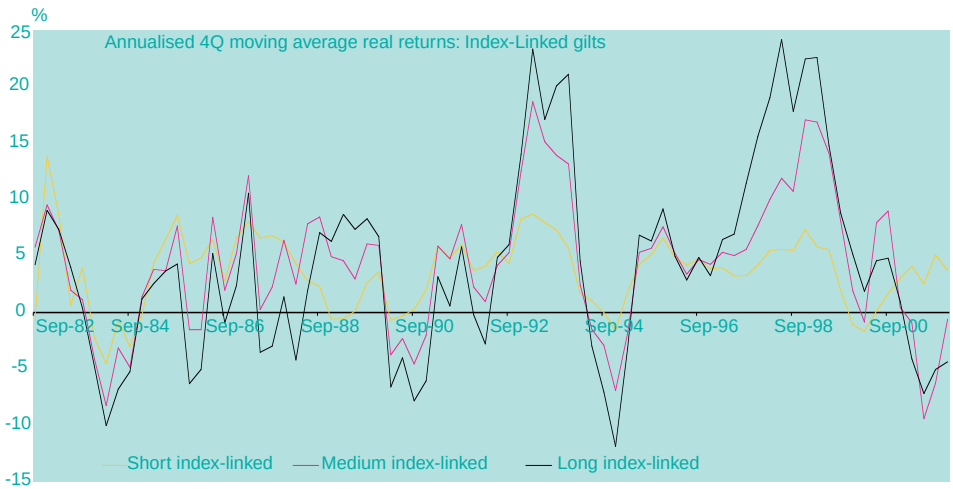
Chart 28
Annualised 4Q moving average real holding period returns: Conventionals gilts Q1 1971 - Q4 2001



Source: DMO, Bank of England

[33] Using the rolling average of the previous four quarters simply smoothes some of the large within-quarter fluctuations.

Chart 29
Annualised 4Q moving average real holding period returns: Index-linked gilts Q3 1982 - Q4 2001



Source: DMO, Bank of England

Comparing conventional and Index-linked gilts

While it is to be expected that the average return on nominal bonds should exceed that on index-linked bonds (as index-linked bonds provide considerable insurance against inflation[34]), table 20 shows that the real return spread between conventional and index-linked bonds has been significant since their introduction in 1982.

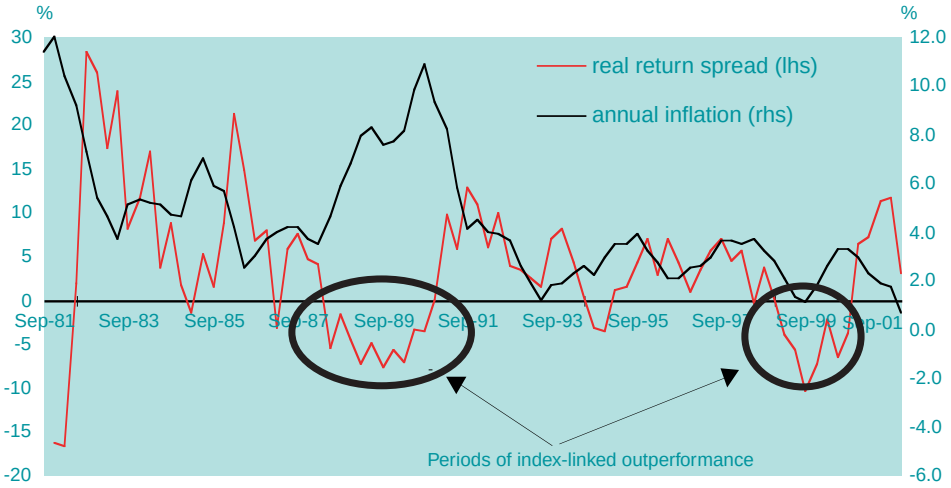
Table 20
Average annualised real holding period return spreads between conventional and index-linked bonds

Period	Class of Bond	Annualised mean return spread (% pa)
Q3 1982 - Q4 1989	Shorts	1.65
	Medium	3.28
	Long	4.66
Q1 1990- Q4 2001	Shorts	1.71
	Medium	2.62
	Long	2.70
Q1 1995- Q4 2001	Shorts	1.07
	Medium	2.00
	Long	1.69

During the 1980's long conventional bonds produced an annual real return over 4.5 percentage points higher than the equivalent index-linked bond. This large observed spread comprises an inflation risk premium (how much people are willing to pay for insulating themselves from inflation) as well as the difference between ex-ante inflationary expectations and the actual out-turns during the period. The divergence between ex-ante inflation expectations and ex-post outturns (an inflationary expectations error) may be particularly high if inflation is volatile or the inflationary environment is transforming, say from a period of relatively high inflation to one which is much lower, as outcomes would be much more difficult to predict. Table 19 indicates that, on average, between 1982 and 2001, returns on conventional gilts have been around 20% more volatile than those on index-linked gilts, although this had reduced to about 10% during the 1995-2001 period, when inflation had become more stable. This observation is consistent with the inference that the combined inflation risk premium and inflationary expectations error was substantial over that period.

[34] In practice UK index-linked bonds are not a perfect hedge against inflation because the indexation occurs with an eight month lag. This permits the calculation of accrued interest to be exchanged in trades that take place between coupon payments.

Chart 30
Spread between medium conventional and index-linked bonds (Q3 1982-Q4 2001, annualised 4Q moving average real holding period returns and inflation)



Source: DMO

Chart 30 shows that unanticipated periods of high or increasing inflation have been associated with significant out-performance of index-linked gilts, with a consequent narrowing of the spread between conventional and index-linked bonds. The two periods highlighted in chart 3, where medium index-linked bonds outperformed medium conventional bonds for a sustained period, came when annual inflation jumped from 3.5% in Q2 1988 to 10.9% in Q3 1990, and again as inflation increased from 1.1% in Q3 1999 to 3.3% in Q3 2000. A similar pattern is repeated for long- and short-term bonds, although the impact is less pronounced in the latter. While index-linked bonds appear to have offered poor real returns relative to conventional bonds, chart 30 demonstrates that they have provided considerable insurance against unanticipated increases in inflation.

Table 20 also suggests that the continued inflation premium and inflationary expectations error appear to have declined as the UK moved from a high inflationary environment in the 1980s, to a much lower and more stable (and therefore predictable) inflationary environment in the 1990s.

Any long-term decline in the real return spread between conventional and index-linked bonds, perhaps resulting from a more stable inflation framework, reduces the cost advantages to the government from issuing index-linked bonds. Nonetheless, inflation-linked bonds may still provide a valuable mechanism for government to absorb some of the additional costs from demand shocks to the economy (see DMO Annual Review 2000-01 for a discussion). They also allow many investors, such as pension funds, to better match their assets to inflation-linked liabilities suggesting that they will remain attractive to such investors.

Comparing holding period returns in different periods

Table 19 showed that the unconditional mean of real holding period returns increased with maturity for both conventional and index-linked gilts between 1982 and 2001, indicating that on average the yield curve was 'normal' i.e. upward sloping. However, this observation is time dependent. Table 21 shows the mean holding period returns and standard deviation on conventional and index-linked bonds during four different sub-periods. The average holding period return on conventional medium-term bonds was higher than that for long-term conventional bonds during the 1970s, and the same is true for both conventional and index-linked bonds during the 1980s. This is more indicative of a 'humped' yield curve and is consistent with the shape of the UK's yield curve at the end of 2001-02 (see chapter 2). Indeed, this humped pattern, with medium-term bonds outperforming other classes, is repeated for the mean holding period return on conventional bonds between 1971 and 2001 is observed.

A simple expectations theory interpretation of a humped yield curve might be that, on average, short-term interest rates were expected to rise in the medium-term but to fall back again in the long-term. However, the observed shape might also be explained by the concentration of different investors at particular maturities along the yield curve i.e. if insurance companies and pension funds, who are the dominant investor base, have a strong preference to match long-term liabilities with long maturity assets this could result in the observed hump.

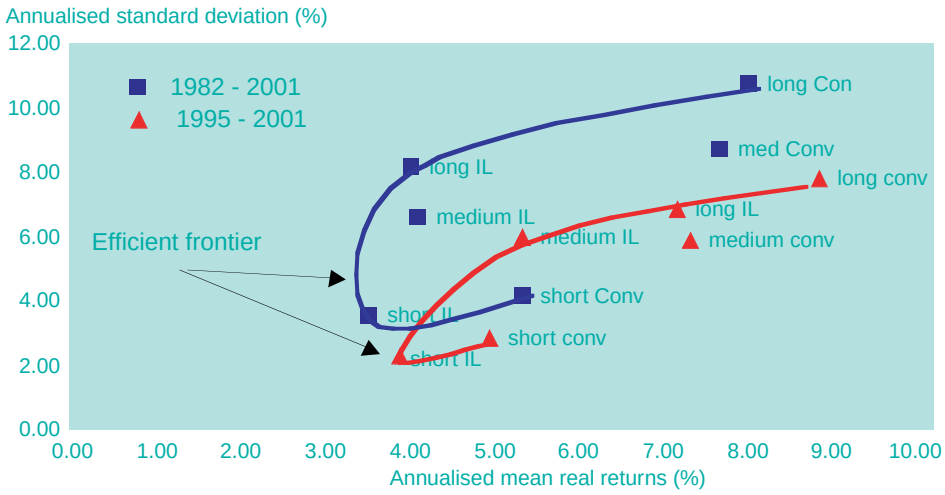
The volatility of returns, as measure by their annualised standard deviation, increases with bond maturity, irrespective of the timeframe used. However, table 21 indicates that, while the mean return for different bonds has increased over time, their volatility as measured by their standard deviation has consistently declined since the 1970s.

Table 21
Holding period returns

	Class of Bond	Annualised Mean Real HPR (%)	Annualised Standard Deviation	Inflation RPI (%) YOY
Mean 1970-1980	Short Conventional	-4.73	6.69	
	Medium Conventional	-3.95	16.32	
	Long Conventional	-5.35	18.53	
Average		**-4.68**	**13.85**	**12.65**
Mean 1980-1990	Short Conventional	4.86	4.15	
	Medium Conventional	6.81	8.70	
	Long Conventional	6.61	10.75	
Average Conv		**6.09**	**7.87**	
	Short Index-linked	3.21	3.52	
	Medium Index-linked	3.54	6.59	
	Long Index-linked	1.94	8.14	
Average IL		**2.90**	**6.09**	**7.45**
Mean 1990-2001	Short Conventional	5.50	3.67	
	Medium Conventional	7.23	8.00	
	Long Conventional	8.08	10.37	
Average Conv		**6.94**	**7.35**	
	Short Index-linked	3.78	2.71	
	Medium Index-linked	4.62	6.22	
	Long Index-linked	5.38	7.99	
Average IL		**4.59**	**5.64**	**3.55**
Mean 1995-2001				
	Short Conventional	5.00	2.82	
	Medium Conventional	7.38	5.86	
	Long Conventional	8.90	7.82	
Average Conv		**7.09**	**5.50**	
	Short Index-linked	3.93	2.29	
	Medium Index-linked	5.37	5.96	
	Long Index-linked	7.22	6.82	
Average IL		**5.51**	**5.03**	**2.75**

Chart 31 plots the average holding period return and standard deviation of short, medium and long conventional and index-linked bonds between 1982-2001 (in blue) and 1995-2001 (in red). For each period an 'efficient frontier' is plotted indicating the trade-off between the level of return and the volatility of that return. Investors will seek the portfolio that provides the highest return with the lowest standard deviation. The objective of the debt issuer is to aim for the portfolio with the lower return. But they are also interested in minimising the volatility of that return.

Chart 31
Average annualised real holding period returns and standard deviations



Source: DMO

Chart 31 shows that the efficient frontier is sensitive to the time period over which it is calculated, i.e. the efficient frontier over the period 1995-2001 (red line) is lower than that between 1982-2001. This suggests that historic data are of little use to proxy future returns and therefore as a basis for future portfolio decisions. Different monetary or fiscal policy regimes, or a change in bond supply, can all impact on the combination of risk and return on the debt portfolio. The chart also suggests that over the longer period, investors would have achieved an attractive risk-return trade-off if they held a long index-linked portfolio, while over the shorter time period a medium index-linked portfolio appears attractive. Interestingly, in both periods a short portfolio (either conventional or index-linked, or some mixture of the two) would have been most attractive from an issuer's perspective.

We can perform various tests on the means of different samples to see if there is a significant difference between the real holding period return across different classes of gilts. The simplest test for the equality of sample means is a z-test. Table 22 gives a sample of results from various z-tests on the mean differences between the six classes of bonds. The null hypothesis is that the difference between the means is zero and a 95% confidence level is used.

Despite considerable differences in the average real returns on different bond classes, mean returns were statistically indistinguishable across bond classes. The mean real returns between medium and long bonds, either conventional or index-linked, were the most indistinguishable — the spread between average returns on medium and long bonds was usually smaller than for short to medium bonds, particularly for conventional bonds, and the volatility much higher. Table 22 indicates that the most significant spreads were between mean real returns on short and medium bonds. This could reflect that the returns on short-term bonds are more closely associated with fluctuations in short-term monetary policy rates than longer-term bonds, which also reflect expectations about the future path of economic growth.

Table 22
z-test equality of sample means

	z-statistic	P(Z<=z) two-tail*
Short – medium conventional bonds (1970 - 2001)	1.0597	29%
Medium - long conventional bonds (1970 - 2001)	0.1273	89%
Short – long conventional bonds (1970 - 2001)	0.4709	64%
Short – medium index-linked bonds (1982 - 2001)	0.3316	74%
Medium - long index-linked bonds (1982 - 2001)	0.0323	97%
Short conventional – short index linked bonds (1982 – 2001)	0.1985	84%
Medium conventional – medium index linked bonds (1982–2001)	0.3082	76%
Long conventional – long index linked bonds (1982–2001)	0.2751	78%

**P: probability of observing a sample value as extreme as or more extreme than z observed, given H0 = true*

The z-tests also showed that the mean real returns between conventional and index-linked bonds were statistically indistinguishable. Similarly, z-tests on the same class of bond over different sub-periods also proved inconclusive (e.g. short conventional bond returns between 1982-1994 and the lower inflation environment in 1995-2001).

These results — both between bonds of different maturity and between conventional and index-linked bonds of the same maturity — were confirmed by using the more sophisticated F-test, which relies less on the assumption that the observations are normally distributed than z-tests. This test confirmed all the earlier results, indicating a strong probability that the mean quarterly returns between asset classes and over time were equal (none could be rejected even at the 10% confidence level). However, because the sample variances are large relative to the sample means, it may be difficult to detect differences in population means whatever test is used. Therefore, no great reliance can be placed on the finding that there is no statistical difference in return across type or maturity of bond.

Mean-reverting returns

The above tables and charts have shown that real mean holding period returns have generally increased over time, along with the decline in volatility and level of inflation. Table 23 indicates that there is strong evidence that real returns on conventional bonds (Q3 1970 – Q4 2001) and index-linked bonds (Q3 1982 – Q4 2001) are mean-reverting[35]. This finding is perhaps surprising given the relatively short time frame observed.

Table 23
Stationarity tests (Augmented Dickey Fuller Statistics)

Class of gilt	(1970 - 2001)	(Q3 1982 – Q4 2001)
Short Conventional	-5.123**	
Medium Conventional	-5.441**	
Long Conventional	-5.548**	
Short Index-linked		-3.446**
Medium Index-linked		-4.409**
Long Index-linked		-4.023**

Tests include two lags of the dependent variable.
*** Indicates rejection of the null of non-stationarity at the 1% level*

[35] The Augmented Dickey-Fuller statistic was calculated for each class of bond. The null hypothesis of non-stationarity at the 1% level could be rejected in the majority of cases with or without a trend.

Conclusions

Clearly over time, real returns on gilts, particularly nominal gilts have become less volatile. This is probably principally due to the evolution of inflation over the period. It also appears to be the case that real returns on index-linked are on average lower than on conventional gilts, and although we do not find any strong statistical evidence of any differences, the real mean return spread appears to be narrowing (indicating a declining inflation premium). This observation would be consistent with the economy's transition from a period of particularly high inflation, when the inflation protection offered by index-linked gilts was particularly valuable, to a more stable low-inflation environment. Therefore, the relative attractiveness of inflation insurance to both investors and issuers has declined since the early 1970s, although index-linked gilts may still provide a valuable addition to government and investor portfolios.

Despite the significant differences in the unconditional averages of real returns between bond classes the tests on equality of means was unable to reject the simple expectations theory. Although this may be largely as a result of the high volatility of real bond returns other studies have concluded that the expectations theory seems to do a reasonable first order job at explaining the term structure of interest rates at long horizons[36]. Even if the unconditional averages show only a relatively weak pattern, it is possible that there may be periods when either short or long bonds outperform, suggesting the existence of a time-varying term premium. This finding complements recent empirical work that has focussed on determining whether time-varying term premium exist to explain the differences in short and long term interest rates.

[36] This is consistent with findings from for the US in J Cochrane, New facts in Finance, NBER Working paper 7169, June 1999 and for Europe in Gerlach and Smets, The term structure of Euro-rates: some evidence in support of the expectations hypothesis, Journal of International Money and Finance, vol 16, no. 2 1997.

Chapter 7: Issues in Debt Management

Balance Sheet management and Surrogate Finance

An awareness of the Government's financial balance sheet is an increasingly important focus of debt management. In practice this means:

- The development of a strategy for the balance sheet to minimise financing costs over time while ensuring that all commitments are met.
- A much greater emphasis on analysis of all the risks to which the financing components of the Government's overall balance sheet are exposed, including market, budgetary and credit risks.

Greater transparency of the risks to the government's balance sheet, and the need for appropriate analytical tools and risk management polices, is an international, not only a UK, development. Particularly relevant is the promulgation of the IMF/World Bank guidelines on sovereign debt management, strongly supported by the UK, and the associated peer review process.[37] In the UK recent work in this area includes:

- HM Treasury's Whole of Government Accounts (WGA) programme which will develop a balance sheet for the whole of the public sector.[38]
- The integration since July 2002 of the functions of the Public Works Loan Board (PWLB), and the Commissioners for the Reduction of the National Debt (CRND) into the Debt Management Office (DMO), thereby greatly widening the extent of the DMO's overview and operational responsibility for the balance sheet.
- Continuing work on the optimal portfolio.

But the debt manager's task is complicated by other developments in the pattern of Government liabilities and flows. For example, in the UK:

- The value of private finance initiative (PFI) spending has been growing rapidly following the Government's reforms to create a level playing field between conventional and private finance delivery where the mechanism for decision is value for money. Capital spending by the private sector on PFI schemes is currently running at over £4 billion a year, and expected to continue at nearly that rate. Estimated government payments under PFI contracts are also over £4 billion a year and growing.
- The Government is also committed to using other Public Private Partnerships (PPPs) where these provide better value for money compared with public sector investment projects. PPPs are being used in a number of public sector institutions to help these businesses to compete and provide improved services while public interest issues remain the responsibility of the Government. Examples here include the PPPs for the London Underground, National Air Traffic Services and QinetiQ (the Defence Evaluation Research Agency). In these cases the PPP has the effect of levering in private sector capital; but the Government has a continuing role and responsibilities.

---

[37] The IMF guidelines on public debt management were published in March 2001 – these are available on the IMF web site (www.imf.org/external/mp/mae/pdebt/2000/eng/guide.pdf) and will be supplemented by country case studies in 2003

[38] An early precursor in the form of an assets and liability risk monitor was published in the Debt and Reserves Management Report 2002-03 (HM Treasury, March 2002). Further information on WGA is available from www.wga.gov.uk.

- The Government has extended direct guarantees to some major projects, notably the bonds issued by London and Continental Railways to finance the Channel Tunnel Rail Link, which currently total £3.75 billion. The Government, through the Strategic Rail Authority, will also have a number of reserve powers in relation to Network Rail plc, which are of the nature of a contingent liability.

All these flows and commitments are justified by value for money or other policy reasons; but they might be described as "surrogate financing", i.e. the use of innovative financing techniques to lever-in private sector capital to support the Government's objectives and thereby lessen the impact that might otherwise arise on the key fiscal aggregates. These developments in turn can complicate somewhat the debt manager's task to monitor and analyse the Government's balance sheet.[39] They have implications for the Government's exposure to both market risk (insofar as market movements create exposure in respect of guarantees, real or implied) and to credit risk (insofar as the Government is exposed to the continued financial health of commercial partners). It is also important that the full nature of these commitments are published to secure the benefits of greater transparency.[40]

Surrogate financing can bring other challenges for the debt manager. In practice it displaces conventional government financing, ie the issuance of Government bonds, i.e. gilts in the UK. At a time of relatively low issuance, which has certainly been the case in the UK in recent years (although less so in the current financial year), potentially it detracts from liquidity in the Government bond market, can exacerbate the shortage of high quality assets for pension and other funds, and can contribute to yield curve distortion and volatility of credit spreads. In addition, debt managers must develop the expertise needed both to manage these market consequences and to analyse and react to the additional market and credit risks.

In UK the issues arising are less problematic than in some other countries. There are a number of relevant considerations:

- Local authorities' capital programmes are financed overwhelmingly by borrowing from Central Government. Under the Government's recently published spending plans[41], that will potentially add some £3 billion to the Government's cash requirement, and hence gilt issuance, by comparison with the authorities borrowing from the market.[42]
- The Government has no intention of moving transactions off balance sheet for cosmetic reasons. As emphasised above, PFI projects are about value for money, and the balance sheet impact is a consequence of the decisions. It is no part of the debt manager's job to argue against value for money just because it complicates the task.

---

[39] Some European countries are going much further than the UK in this respect and creating arms-length development agencies, with powers to raise capital, as a vehicle to finance major government capital programmes.

[40] The UK Government's contingent liabilities are currently reported to Parliament and disclosed annually in the Consolidated Fund and National Loans Fund Accounts Supplementary Statements.

[41] Public Expenditure Statistical Analyses 2002-03 (Cm 5401) Table 6.3.

[42] In this respect the UK's position contrasts with that of a number of other countries. To take one example Australia has a much lower ratio of net Government debt to GDP than does the UK (around 5% compared to 30%) which in turns creates a number of problems for the efficient functioning of the bond market. But the Australian States raise capital on their own account, rather than borrowing from the Commonwealth Government. The range of issues outlined in this section of the Review was widely discussed at a Conference organised by the Australian Finance and Treasury Association in Canberra in April 2002.

- Under the Government's spending plans, gross gilt issuance in 2002-03 will be £22.4 billion (cash). Next year the financing requirement is expected to be some £38 billion, most of which is likely to be met by gilt sales. This compares with gilt sales of £13.7 billion in 2001-02 and £10 billion in 2000-01. Although liquidity in the gilts market is still poor, this change has taken off some of the pressure.

Whatever the extent of surrogate financing, the need remains for the debt manager be alive to implied contingent liabilities and Government financing commitments; and to have the tools to recognise and manage them.

Costs and risks involved in debt management

The "Guidelines for Public Debt Management"[43], jointly published by the IMF and the World Bank state that: "The main objective of public debt management is to ensure that the government's financing needs and its payments obligations are met at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk." In common, with many government debt managers, the UK DMO shares this objective. However, the cost and risk in question are generally not explicitly defined. One question that debt managers often ask is whether there is a standard issuance rule or optimal portfolio structure that would generally provide low cost financing with minimal risk. This section attempts to shed some light on the possible costs and risks that might be considered when working towards this objective and uses a simple thought experiment to illustrate some of the underlying issues. It adds to the discussion on managing risk in the gilts portfolio contained in the Annual Review 2000-01 and complements the discussion of holding period returns in chapter 6.

For many governments, the "cost" that is considered is the nominal debt servicing cost or the nominal cost expressed as a proportion of GDP (a tax-smoothing approach).[44] This is particularly the case where governments are operating within a specific constraint on their budget deficit, for example the constraint imposed by the Maastricht treaty. In this experiment, we focus on the aggregate nominal costs over the forecast horizon.

With respect to assessing the risk of any chosen issuance strategy, a variety of measures can be used. Many debt managers focus on the duration of the portfolio as an indicator of the exposure of debt servicing costs to future changes in interest rates.[45] An alternative would be to consider the potential volatility of the debt servicing costs and to adopt a strategy that would minimise this volatility. We consider both of these approaches in our discussion below.

---

[43] See footnote 37.
[44] See Annual Review 2000-01 for a discussion
[45] For example, it could give an indication of risk of ex-post regret arising from locking into higher financing rates in the past relative to current conditions.

The experiment

Let us consider the CGNCR as forecast by HM Treasury in the Budget Statement 2002 for years 2002-03 to 2006-07 inclusive. Taking into account expected redemptions results in forecast net financing requirements as set out in table 24 below. If we assume that the resultant financing requirements are met entirely through Treasury bill and gilt sales then we can construct a simple scenario and consider the sensitivity of a range of financing strategies to interest rate outcomes. The objective would be to identify a standard issuance strategy that would appear to offer low costs and low sensitivity to interest rate changes.

For the purposes of this discussion we consider only the interest rate risk associated with the marginal debt service costs of the forecast new issuance over the next four years; no account is taken of the existing debt portfolio.

Table 24

Year	Forecast CGNCR (£bn)	Redemptions (£bn)*	Indicative gross funding requirement (£bn)
2003-04	17.7	20.5	38.3
2004-05	16.3	15.2	31.5
2005-06	20.8	14.6	35.3
2006-07	24.4	18.6	43.0

**Assuming that all double-dated issues currently above par are redeemed at the first maturity date.*

Source: HMT, DMO

Methodology

In order to determine the nominal amount of gilts and Treasury bills to be issued to meet the forecast financing requirements, we derive the forward par gilt curves at quarterly intervals implied by the yield curve estimated mid-May 2002.

It is assumed that each year's financing is spread evenly over the four quarters of the year, with issuance at the end of the quarter. Issuance is done in accordance with the rule defined at the start of the period.

We consider eight different financing strategies: four pure strategies and four mixed strategies. The four pure strategies are:

- All 6-month
- All 5-year
- All 10-year
- All 30-year

The four mixed strategies are:

- Mixed shorts: 50% 6-month and 50% 5-year
- Mixed longs: 50% 10-year and 50% 30-year
- Butterfly: 50% 6-month and 50% 30-year
- Mixed: 25% of each

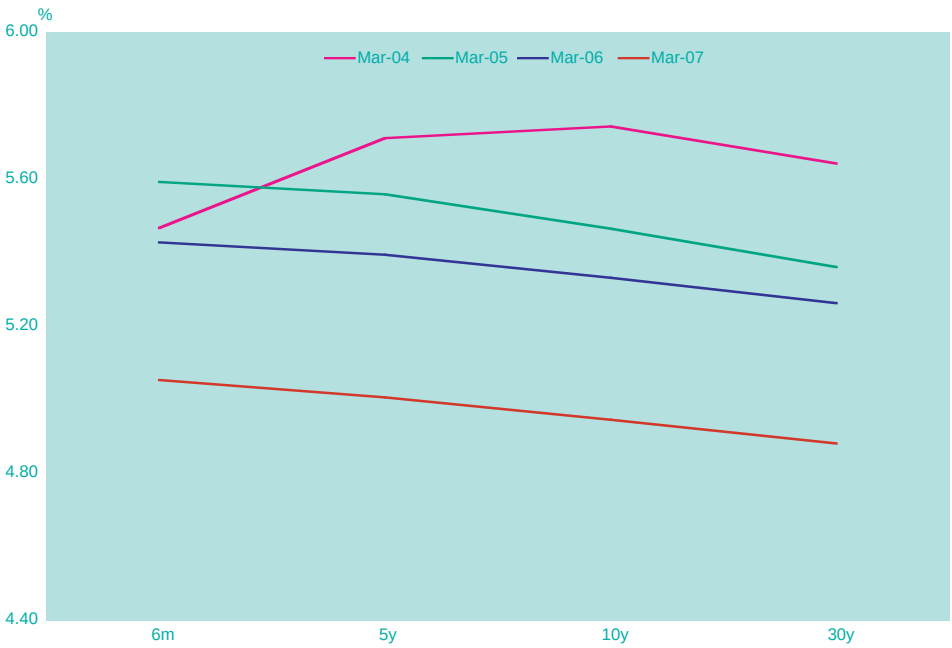
For the purposes of this experiment we restrict ourselves to nominal securities only; effectively we assume that the inflation target is met throughout the period and that break-even inflation rates are consistent with that outcome.

The estimated forward curves are then used to calculate the coupons on each bond so that they are issued at par (chart 32 below shows a sample of the forward curves used).[46] This means that the gross amount of nominal debt issued is equivalent to the financing requirement each year and is the same under each financing strategy.

---

[46] For example, this results in issuance of the following 5-year bonds in 2003-4: 5.55% June 2008, 5.57% Sept 2008, 5.59% Dec 2008 and 5.59% March 2009.

Chart 32
Examples of forward gilts yield curves



Source: DMO

Table 25 below shows the resultant nominal costs for each financing strategy, aggregated over the entire forecast horizon. Unsurprisingly given the shape of the forward yield curves, strategies that include 30-year bonds perform well in terms of cost, with the all 30-year strategy resulting in the lowest marginal cost.

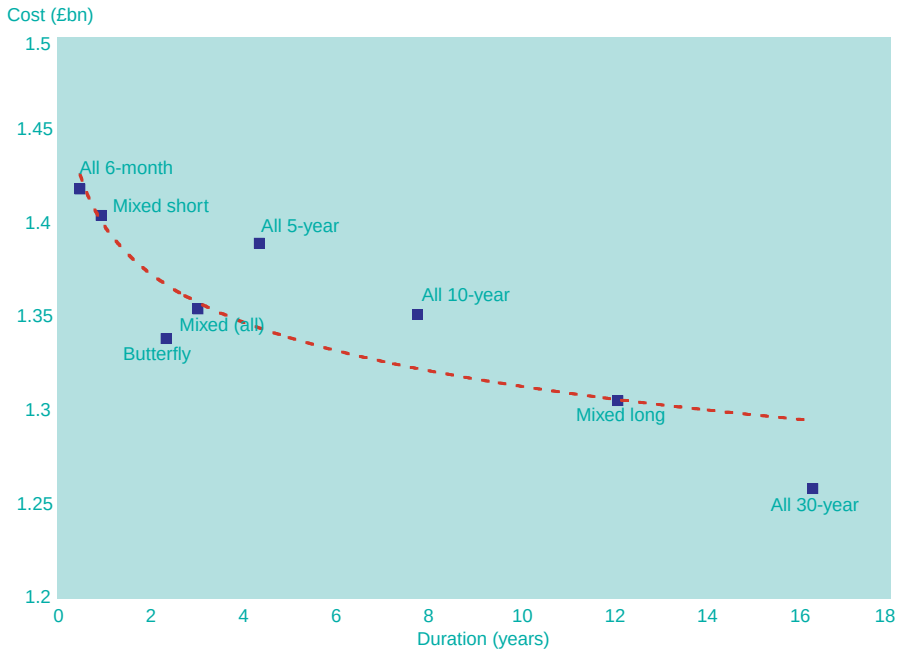
Table 25
Debt servicing costs of each issuance strategy (£bn)

Issuance strategy	Base cost (£bn)	Duration (years)
All 6-month	1.419	0.5
All 5-year	1.390	4.4
All 10-year	1.352	7.8
All 30-year	1.259	16.3
Mixed short	1.405	1.0
Mixed long	1.306	12.1
Butterfly	1.339	2.4
Mixed (all)	1.355	3.0

Table 25 also shows the (current) duration of the marginal portfolios.[47] We can consider the trade-off between duration and cost (chart 32). Many European debt managers are actively reducing the duration of their portfolios; that strategy would be consistent with minimising costs where the yield curve is upward sloping, i.e. normal. As chart 32 clearly shows this is not the case for the UK in this scenario with duration and cost negatively correlated.

[47] This is the simple weighted average of the modified duration of each component; this makes the very strong assumption that covariances between components are zero.

Chart 33
Trade off between cost and duration



Source: DMO

A fitted trend line is marked on the chart indicating the average relationship between cost and duration in this scenario. As discussed above, this trend would probably be upward sloping if a debt manager faced a normal yield curve. All points below and to the left of the trend-line represent an improvement for the government i.e. they represent points where the cost of debt can be reduced without increasing the duration of the marginal portfolio or where the duration of the marginal portfolio can be reduced without increasing costs.[48] From this chart, the butterfly strategy (below the line) appears to perform well, providing an attractive combination of low cost and low duration in this scenario. The all-30 year strategy also represents an improvement relative to points of similar duration on the trend line. However, that strategy might be unattractive given its duration and the potential level of ex-post regret that that represents.

What about the potential volatility of debt servicing costs associated with each portfolio?

Consider the risk of committing to one of the strategies now – then we are exposed to the risk that interest rates might move between now and when we actually issue the bonds. We consider three different scenarios. The results are shown in Table 26.

One simple way of assessing the extent of this risk is to consider what the resultant costs would be if the forward curves were subjected to a 100bp parallel shift at every point. This is scenario 1. In this scenario, bonds continue to be issued at par but at a higher coupon; this generates the estimated increase in debt servicing costs.

[48] Assuming it is desirable to keep duration low.

Table 26

	Scenario 1		Scenario 2				Scenario 3	
	100 bp parallel shift		Based on duration of portfolio				Based on volatility at each issuance point	
	Cost (£bn)	% increase over base	Volatility of representative interest rate (%)*	Corresponding specific parallel shift (bp)	% Cost (£bn)	% increase over base	Cost (£bn)	% increase over base
All 6-month	1.674	0.18	16.8	78	1.618	0.14	1.637	0.15
All 5-year	1.631	0.17	18.6	84	1.593	0.15	1.585	0.14
All 10-year	1.603	0.19	17.2	78	1.548	0.14	1.539	0.14
All 30-year	1.509	0.20	15.9	70	1.434	0.14	1.445	0.15
Mixed short	1.652	0.18	32.4	138	1.747	0.24	1.611	0.15
Mixed long	1.556	0.19	16.4	73	1.488	0.14	1.492	0.14
Butterfly	1.591	0.19	22.8	99	1.589	0.19	1.541	0.15

**Source: Bloomberg – monthly volatility measured over a year.*

These results indicate that while issuing only long-dated gilts results in the lowest cost, given that the resulting portfolio has the longest duration, the costs are most sensitive to parallel shifts in the yield curve.

However, this approach takes no account of possible changes in the slope and curvature of the curve, or of the historic volatility at various points along the yield curve. Therefore, we may be penalising long issuance more than is justified. An alternative scenario would be to consider a parallel shift consistent with the historic volatility of the interest rate that matches the duration of the portfolio.[49] So, if the duration of the portfolio is 0.5 years, we consider the volatility of a six-month rate and the parallel shift is determined by the upper bound of a 95% confidence interval about that rate.[50] This is scenario 2 in table 26.

Under this scenario, the lower volatility of the relevant long interest rate results in a lower parallel shift being applied to the longer portfolios. Here, it is the mixed short portfolio that fares worst, given the higher volatility of 1-year interest rates, while it is difficult to distinguish between the all 30-year, mixed long, all 10-year and all 6-month strategies.

Finally, we could consider a scenario that imposes a shock to each forward rate at which we issue, consistent with the historic volatility of that rate.[51] This approach takes account of the relative volatilities at each point of the yield curve but imposes the restriction that the shocks to yields are perfectly correlated.[52] Again considering the upper bound of a 95% confidence interval around our estimated forward yield leads to the results shown in table 26.[53] Interestingly, under this scenario, there is very little to distinguish between our chosen issuance strategies.

---

[49] This is related to the Budget-at-Risk approach followed by some debt managers.
[50] Defined by 1.65*s(m) where s(m) is taken over a quarterly holding period. Note that this makes the strong assumption that the identified interest rate is actually representative of the overall portfolio.
[51] Measured as before.
[52] ie if the 5-year rate reaches the upper bond on its 95% confidence interval, so do the 6-month 10-year rate.
[53] In practice the shock applied to each maturity, m, is 1.65*s(m) where s(m) is defined as before.

Conclusion

The analysis above attempts to illustrate some issues surrounding the question of whether we can identify an issuance strategy that provides low cost financing with minimal risk. From a cost point of view, it seems to suggest that in the UK over the short-term, a strategy involving a significant proportion of long bonds would be desirable. However, if we then take account of risk, the implications are sensitive to the measure of risk used.

The rankings of various portfolios on the basis of costs implied by this analysis appears to contradict those implied by the analysis of holding period returns in chapter 6. Here, shorter portfolios result in higher debt servicing costs. This reflects the fact that this analysis is based on the current shape of the yield curve and the expectations about the future that that embodies, whereas the holding period returns is based on historic observations over a much greater period of time.

Finally, the analysis presented above is simplistic and is based on a number of very strong assumptions, particularly about the shape of the forward curves, and should not be taken as an indication of future policy.

Chapter 8: The DMO

The DMO was established on 1 April 1998, with the aim '… to carry out the Government's debt management policy of minimising financing costs over the longer term, taking account of risk, and to manage the aggregate cash needs of the Exchequer in the most cost effective way'.

In institutional terms, the DMO is legally and constitutionally part of HM Treasury, but, as an executive agency, it operates at arm's length from Ministers. The Chancellor of the Exchequer determines the policy and operational framework within which the DMO operates, but delegates to the Chief Executive operational decisions on debt and cash management, and day-to-day management of the office.

The separate responsibilities of the Chancellor and other Treasury Ministers, the Permanent Secretary to the Treasury and the DMO's Chief Executive are set out in a published Framework Document- (available on the DMO web site at www.dmo.gov.uk), which also sets out the DMO's objectives and its Chief Executive's lines of accountability. The Chief Executive is accountable to Parliament for the DMO's performance and operations, both in respect of its administrative expenditure and the Debt Management Account.

On 1 July 2002 the operations of the Public Loan Works Board (PWLB), and the Commissioners for the Reduction of the National Debt (CRND)[54] were integrated with the DMO, and the relevant staff relocated to the DMO's premises. The PWLB lends to local authorities for capital purposes. The CRND's principal function is managing the investment portfolios of certain public funds. PWLB and CRND continue to carry out their longstanding statutory functions within the DMO.

Business Planning

The DMO publishes an annual Business Plan[55]. The plan sets out the DMO's targets and objectives for the year ahead, and the strategies for achieving them. It also reviews the immediately preceding year.

The starting point of the DMO's business plan is the strategic objectives given by the Chancellor of the Exchequer to the DMO and set out in the Framework Document. Annex D sets out the DMO's strategic objectives operating throughout 2001-02, together with a summary record of achievement against them. The DMO's performance against targets is covered in Annex E.

---

[54] The activities of the CRND were previously administered by the National Debt Office (NDO).

[55] The DMO Business Plan for 2002-03 was published in April 2002 – it is available from the DMO or on its web site www.dmo.gov.uk

Organisation and Resources

The DMO is organised flexibly to ensure that resources are available as necessary for the respective tasks.

The DMO's functional organisation was changed during 2001, and its corporate governance arrangements further developed. There are now two main business areas in the DMO: policy and markets, and operations and resources. These areas are in turn split into a number of teams. The broad functional organisation is illustrated in the chart below.

There is substantial working across teams to ensure that both policy and operational concerns are adequately met; that the relevant skills are bought to bear on tasks or problems; and that important operations are adequately resourced. The DMO's Managing Committee considers all major operational and management decisions. The Committee comprises the Chief Executive, together with the heads of the two business areas and of the main functional teams.

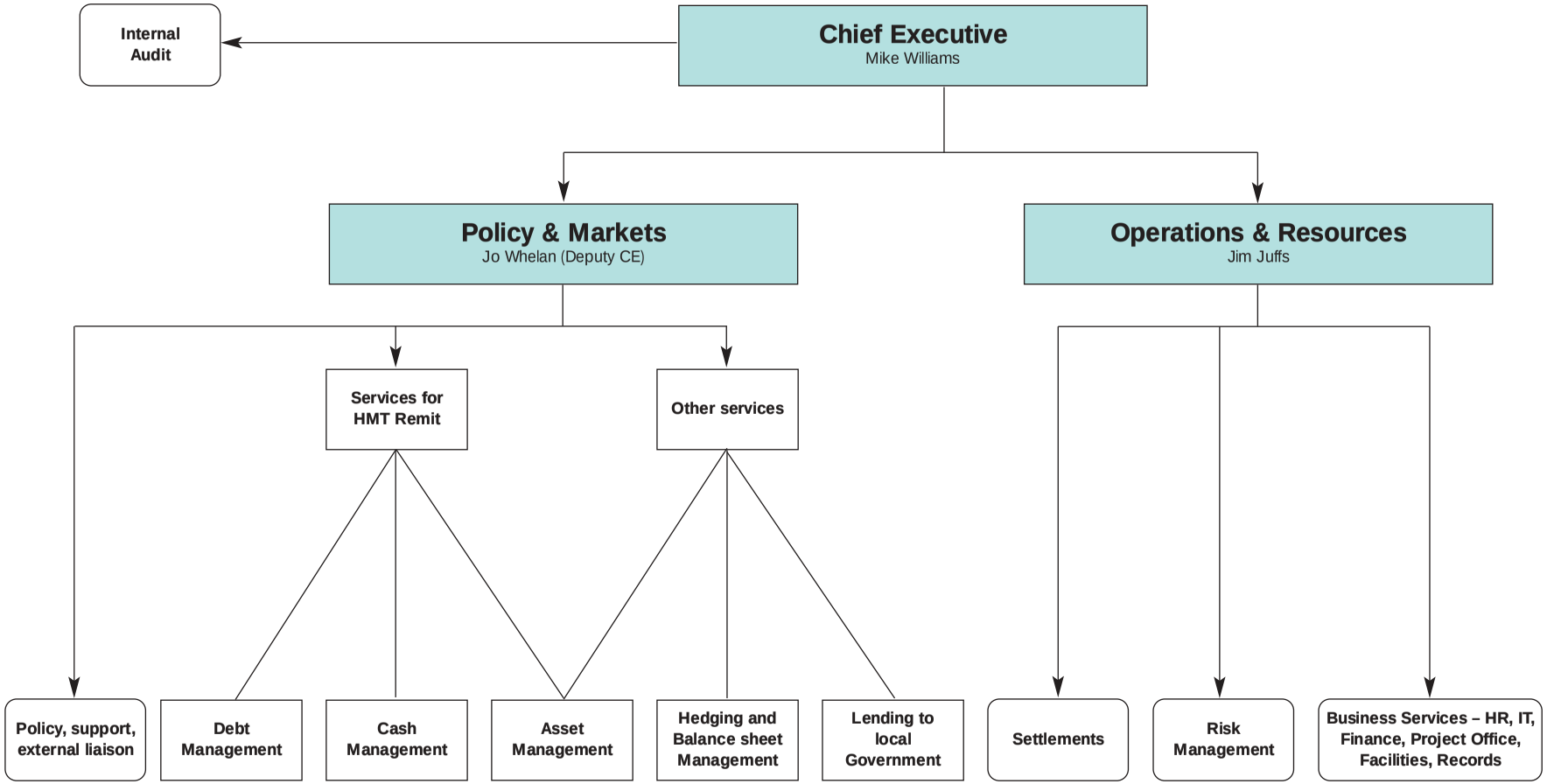
The Managing Committee is guided by an Advisory Board which comprises the Chief Executive, the Deputy Chief Executive (and head of policy and markets) and the head of operations and resources, together with non-executive members from outside the DMO: James Barclay, Colin Price and, from the Treasury, Paul Mills. James Barclay is also Chairman of the DMO's audit committee.

Within the DMO most business issues are considered by one of three cross-cutting committees: on debt strategy; cash strategy; and investment. They are supported by a credit and risk committee, which also reports to Advisory Board.

The DMO's resource requirement is largely driven by the need to meet its responsibilities, as well as the wider need within Government to maintain taut administrative budgets. Its budget, which is financed as part of the budget for HM Treasury as a whole, has to reflect a need for both skills and systems that are not available elsewhere within Government. The DMO's operating costs in 2001-02 were £7.8 million, £1.0 million more than in 2000-01, reflecting a combination of accommodation and capital costs associated with the move to new premises, costs associated with new business projects notably for NS&I and the DMADF (see Introduction) and additional staff costs. Operating costs in 2002-03 will be somewhat higher following the integration of PWLB and CRND into the DMO.

All the DMO's trading operations are accounted for separately from its administrative budget, through the Debt Management Account.

DMO Functional Structure



ANNEX A: Gilts in issue at end-March 2002[56]

Gilts in issue at 31 March 2002 (£mn nominal)
Total amount in issue (inc IL uplift) £mn 278,719

Conventional gilts	Redemption date	Dividend dates	Amount in issue (£mn nom)	Amount held in stripped form	Central Govt holdings (DMO & NILO)
Shorts: (maturity up to 7 years)					
7% Treasury 2002	7-Jun-02	7 Jun/Dec	9,012	94	230
9¾% Treasury 2002	27-Aug-02	27 Feb/Aug	6,538	-	349
8% Treasury 2002/2006	5-Oct-02	5 Apr/Oct	2,064	-	228
8% Treasury 2003	10-Jun-03	10 Jun/Dec	7,014	-	433
10% Treasury 2003	8-Sep-03	8 Sep/Mar	1,783	-	15
6½% Treasury 2003	7-Dec-03	7Jun/Dec	8,002	50	223
5% Treasury 2004	7-Jun-04	7 Jun/Dec	7,423	10	380
3½% Funding 1999/2004	14-Jul-04	14 Jan/Jul	561	-	50
6¾% Treasury 2004	26-Nov-04	26 May/Nov	6,515	-	388
9½% Conversion 2005	18-Apr-05	18 Apr/Oct	4,388	-	14
8½% Treasury 2005	7-Dec-05	7 Jun/Dec	10,396	138	215
7¾% Treasury 2006	8-Sep-06	8 Mar/Sep	3,874	-	351
7½% Treasury 2006	7-Dec-06	7 Jun/Dec	11,721	215	189
8½% Treasury 2007	16-Jul-07	16 Jan/Jul	4,554	-	278
7¼% Treasury 2007	7-Dec-07	7 Jun/Dec	11,022	97	154
5½% 2008/12	10-Sep-08	10 Mar/Sep	1,026		182
9% Treasury 2008	13-Oct-08	13 Apr/Oct	5,463	-	22
Mediums: (maturity 7 to 15 years)					
5¾% Treasury 2009	7-Dec-09	7 Jun/Dec	8,856	21	271
6¼% Treasury 2010	25-Nov-10	25 May/Nov	4,778	-	297
9% Conversion 2011	12-Jul-11	12 Jan/Jul	5,303	-	112
7¾% Treasury 2012/2015	26-Jan-12	26 Jan/Jul	806	-	340
5% Treasury 2012	7-Mar-12	7 Mar/ Sep	13,285	-	97
8% Treasury 2013	27-Sep-13	27 Mar/Sep	6,107	-	311
8% Treasury 2015	7-Dec-15	7 Jun/Dec	7,300	364	94
Longs: (maturity over 15 years)					
8¾% Treasury 2017	25-Aug-17	25 Feb/Aug	7,578	-	206
8% Treasury 2021	7-Jun-21	7 Jun/Dec	16,507	291	112
5% Treasury 2025	7-Mar-25	7 Mar/Sep	5,279	-	32
6% Treasury 2028	7-Dec-28	7 Jun/Dec	11,537	113	90
4¼% Treasury 2032	7-Jun-32	7 Jun/Dec	13,601	40	22
			202,293	**1,433**	**5,685**

[56] 9% Treasury Stock 2008 became a rump stock in August 2002

Index-linked gilts	Redemption date	Dividend dates	Amount in issue £mn (nom)	Nominal including inflation uplift	Central Govt holdings (DMO & NILO)
2½% I-L Treasury 2003	20-May-03	20 May/Nov	2,705	5,952	160
4⅜% I-L Treasury 2004	21-Oct-04	21 Apr/Oct	1,309	1,673	90
2% I-L Treasury 2006	19-Jul-06	19 Jan/Jul	2,006	5,003	6
2½% I-L Treasury 2009	20-May-09	20 May/Nov	2,634	5,796	35
2½% I-L Treasury 2011	23-Aug-11	23 Feb/Aug	3,886	9,033	14
2½% I-L Treasury 2013	16-Aug-13	16 Feb/Aug	4,650	9,034	32
2½% I-L Treasury 2016	26-Jul-16	26 Jan/Jul	5,985	12,708	99
2½% I-L Treasury 2020	16-Apr-20	16 Apr/Oct	4,188	8,748	13
2½% I-L Treasury 2024	17-Jul-24	17 Jan/Jul	5,331	9,459	41
4⅛% I-L Treasury 2030	22-Jul-30	22 Jan/Jul	3,114	3,994	14
			35,808	**71,400**	**504**

Undated gilts (non-rump)	Redemption date	Dividend dates	Amount in issue	Central Govt holdings (DMO & NILO)
2½% Treasury	Undated	1 Apr/Oct	493	22
3½% War	Undated	1 Jun/Dec	1,939	30
			2,432	**52**

Rump gilts are not available for purchase

"Rump" gilts	Redemption date	Dividend dates	Amount in issue	Central Govt holdings (DMO & NILO)
10% Conversion 2002	11-Apr-02	11 Apr/Oct	21	12
9½% Conversion 2002	14-Jun-02	14Jun/Dec	3	2
9% Exchequer 2002	19-Nov-02	19 May/ Nov	83	67
11¾% Treasury 2003/2007	22-Jan-03	22 Jan/Jul	234	78
9¾% Conversion 2003	7-May-03	7 May/Nov	12	10
12½% Treasury 2003/2005	21-Nov-03	21 May/Nov	152	52
13½% Treasury 2004/2008	26-Mar-04	26 Mar/Sep	96	22
10% Treasury 2004	18-May-04	18 May/Nov	20	6
9½% Conversion 2004	25-Oct-04	25 Apr/Oct	307	136
10½% Exchequer 2005	20-Sep-05	20 Mar/Sep	24	16
9¾% Conversion 2006	15-Nov-06	15 May/Nov	6	3
8% Treasury 2009	25-Sep-09	25 Mar/Sep	393	77
9% Treasury 2012	6-Aug-12	6 Feb/Aug	403	120
12% Exchequer 2013/2017	12-Dec-13	12 Jun/Dec	58	2
4% Consolidated	Undated	1 Feb/Aug	358	22
2½% Consolidated	Undated	5 Jan/Apr/Jul/Oct	275	46
3½% Conversion	Undated	1 Apr/Oct	93	73
3% Treasury	Undated	5 Apr/Oct	53	6
2½% Annuities	Undated	5 Jan/Apr/Jul/Oct	3	0
2¼% Annuities	Undated	5 Jan/Apr/Jul/Oct	1	0
			2,594	**750**

ANNEX B: List of GEMMs*[57] as at 31 March 2002

	Web site
ABN Amro Bank NV 250 Bishopsgate London EC2M 4AA	www.abnamro.com
Barclays Capital* 5 The North Colonnade Canary Wharf London E14 4BB	www.barcap.com
Credit Suisse First Boston Gilts Limited One Cabot Square London E14 4QJ	www.csfb.com
Deutsche Bank AG (London Branch) Winchester House 1 Great Winchester Street London EC2N 2DB	research.gm.db.com
Dresdner Bank AG* PO Box 18075 Riverbank House 2 Swan Lane London EC4R 3UK	www.drkw.com
Goldman Sachs International Limited Peterborough Court 133 Fleet Street London EC4A 2BB	www.gs.com
HSBC Bank PLC* Thames Exchange 10 Queen Street Place London EC4R 1BQ	www.hsbcgroup.com
JP Morgan Securities Limited 125 London Wall 60 Victoria Embankment London EC4Y 5AJ	www.jpmorgan.com
Lehman Brothers International (Europe)* 1 Broadgate London EC2M 7HA	www.lehman.com

[57] *Indicates that the GEMM is also a recognised index-linked gilt market-maker.

Merrill Lynch International* www.ml.com
Merrill Lynch Financial Centre
2 King Edward Street
London EC1A 1HQ

Morgan Stanley & Co. International Limited* www. msdw.com
20 Cabot Square
Canary Wharf
London E14 4QA

Royal Bank of Canada Europe Limited* www.royalbank.com
71 Queen Victoria Street
London EC4V VDE

Royal Bank of Scotland PLC* www.rbsmarkets.com
135 Bishopsgate
London EC2M 3UR

Salomon Brothers International Limited www.salomonsmithbarney.com
Citigroup Centre
33 Canada Square
London E14 5LB

UBS Warburg (London Branch)* www.ubswarburg.com
100 Liverpool Street
London EC2M 2RH

Winterflood Gilts Limited* www.wins.co.uk
The Atrium Building
Cannon Bridge
25 Dowgate Hill
London EC4R 2GA

ANNEX C: Treasury bill tender results 2001-02

One-month tenders

Date	Maturity date	Size £mn	Cover	Avg yield %	Avg price £	Yield tail (bp)
06-Apr-01	08-May-01	300	7.87	5.2000	99.5885	0
12-Apr-01	14-May-01	150	6.37	5.2467	99.6134	0
20-Apr-01	21-May-01	150	8.87	5.2393	99.5997	0
27-Apr-01	29-May-01	150	6.57	5.1933	99.5891	1
04-May-01	04-Jun-01	150	8.03	5.1610	99.6197	4
11-May-01	11-Jun-01	150	8.37	5.1000	99.6103	0
18-May-01	18-Jun-01	150	5.57	5.0264	99.6159	2
25-May-01	25-Jun-01	150	7.57	5.0700	99.6264	0
01-Jun-01	02-Jul-01	150	6.57	5.0724	99.6124	1
08-Jun-01	09-Jul-01	500	7.33	5.0631	99.6131	1
15-Jun-01	16-Jul-01	750	7.53	4.9433	99.6222	1
22-Jun-01	23-Jul-01	750	7.15	4.9331	99.6230	1
29-Jun-01	30-Jul-01	750	4.79	4.9986	99.6180	0
06-Jul-01	06-Aug-01	750	6.73	5.0471	99.6143	0
13-Jul-01	13-Aug-01	400	6.49	5.0400	99.6149	0
20-Jul-01	20-Aug-01	150	7.63	5.0500	99.6141	0
27-Jul-01	28-Aug-01	150	8.65	5.0514	99.6003	1
03-Aug-01	03-Sep-01	150	7.50	4.8367	99.6303	1
10-Aug-01	10-Sep-01	150	8.37	4.7460	99.6372	0
17-Aug-01	17-Sep-01	150	6.63	4.8000	99.6331	0
24-Aug-01	24-Sep-01	150	9.58	4.8461	99.6428	0
31-Aug-01	01-Oct-02	150	6.62	4.7831	99.6344	2
07-Sep-01	08-Oct-01	150	8.67	4.7800	99.6347	0
14-Sep-01	15-Oct-01	150	8.60	4.8000	99.6331	0
21-Sep-01	22-Oct-01	150	7.63	4.4300	99.6613	0
28-Sep-01	29-Oct-01	150	8.47	4.3933	99.6641	1
05-Oct-01	05-Nov-01	300	8.13	4.3371	99.6684	1
12-Oct-01	12-Nov-01	300	9.52	4.3667	99.6661	0
19-Oct-01	19-Nov-01	300	8.33	4.3907	99.6643	1
26-Oct-01	26-Nov-01	300	8.29	4.2485	99.6751	0
02-Nov-01	03-Dec-01	500	6.99	4.0932	99.6780	0
09-Nov-01	10-Dec-01	500	7.66	3.7886	99.7102	0
16-Nov-01	17-Dec-01	750	6.69	3.7838	99.7106	1
23-Nov-01	24-Dec-01	900	6.39	3.7435	99.7137	1
30-Nov-01	31-Dec-01	1000	5.23	3.8323	99.7069	2
07-Dec-01	07-Jan-01	1000	6.27	3.8650	99.7044	1
14-Dec-01	14-Jan-01	1000	6.32	3.8849	99.7029	1
21-Dec-01	21-Jan-01	600	5.43	3.9000	99.7017	0
28-Dec-02	28-Jan-02	600	4.37	3.9150	99.7006	1
04-Jan-02	04-Feb-02	1000	6.78	3.8497	99.7056	0
11-Jan-02	11-Feb-02	1000	6.79	3.8923	99.7023	0
18-Jan-02	18-Feb-02	500	7.43	3.8740	99.7037	1
25-Jan-02	25-Feb-02	150	8.83	3.8693	99.7041	0
01-Feb-02	04-Mar-02	150	9.10	3.8900	99.7025	0
08-Feb-02	11-Mar-02	150	9.01	3.8868	99.7027	0
15-Feb-02	18-Mar-02	150	8.83	3.8960	99.7020	0
22-Feb-02	25-Mar-02	300	7.88	3.9000	99.7017	0
01-Mar-02	02-Apr-02	700	5.91	3.9123	99.6901	0
08-Mar-02	08-Apr-02	1000	6.65	3.9250	99.6998	1
15-Mar-02	15-Apr-02	1000	7.24	3.9500	99.6979	0
22-Mar-02	22-Apr-02	1000	6.14	3.9960	99.6944	0
28-Mar-02	29-Apr-02	500	6.07	3.9400	99.7094	1

Three-month tenders

Date	Maturity date	Size £mn	Cover	Avg yield %	Avg price £	Yield tail (bp)
06-Apr-01	09-Jul-01	100	8.55	5.1975	98.7208	0
12-Apr-01	16-Jul-01	100	5.45	5.2500	98.7220	0
20-Apr-01	23-Jul-01	100	10.35	5.1690	98.7277	2
27-Apr-01	30-Jul-01	100	8.02	5.1104	98.7419	2
04-May-01	06-Aug-01	100	8.30	5.0775	98.7635	2
11-May-01	13-Aug-01	100	7.80	5.0400	98.7590	1
18-May-01	20-Aug-01	100	5.85	5.0150	98.7651	1
25-May-01	28-Aug-01	100	6.35	5.0400	98.7590	0
01-Jun-01	03-Sep-01	100	6.20	5.0220	98.7634	2
08-Jun-01	10-Sep-01	100	9.10	5.0303	98.7614	2
15-Jun-01	17-Sep-01	100	8.70	5.0380	98.7595	0
22-Jun-01	24-Sep-01	100	9.80	5.0470	98.7573	1
29-Jun-01	01-Oct-01	100	7.55	5.1000	98.7445	0
06-Jul-01	08-Oct-01	100	8.80	5.0820	98.7488	2
13-Jul-01	15-Oct-01	100	7.39	5.0570	98.7549	1
20-Jul-01	22-Oct-01	100	6.80	5.0300	98.7615	0
27-Jul-01	29-Oct-01	100	8.65	5.0400	98.7590	0
03-Aug-01	05-Nov-01	100	8.06	4.8395	98.8078	1
10-Aug-01	12-Nov-01	200	8.75	4.7500	98.8296	0
17-Aug-01	19-Nov-01	200	7.53	4.7800	98.8223	0
24-Aug-01	26-Nov-01	200	10.85	4.8000	98.8303	0
31-Aug-01	03-Dec-01	200	6.85	4.7100	98.8394	0
07-Sep-01	10-Dec-01	200	10.30	4.6970	98.8425	0
14-Sep-01	17-Dec-01	200	9.35	4.5713	98.8732	3
21-Sep-01	24-Dec-01	200	8.23	4.3197	98.9345	0
28-Sep-01	31-Dec-01	200	8.78	4.3290	98.9322	1
05-Oct-01	07-Jan-02	500	7.45	4.2000	98.9637	0
12-Oct-01	14-Jan-02	500	7.01	4.2280	98.9569	2
19-Oct-01	21-Jan-02	500	7.98	4.2145	98.9602	2
26-Oct-01	28-Jan-02	500	7.78	4.1584	98.9739	0
02-Nov-01	04-Feb-02	500	7.18	4.0035	99.0117	2
09-Nov-01	11-Feb-02	600	7.96	3.7291	99.0789	0
16-Nov-01	18-Feb-01	700	8.36	3.7821	99.0659	1
23-Nov-01	25-Feb-01	700	6.31	3.7579	99.0718	0
30-Nov-01	04-Mar-01	700	5.36	3.8069	99.0598	1
07-Dec-01	11-Mar-01	700	6.26	3.8485	99.0496	2
14-Dec-01	18-Mar-01	700	6.60	3.8571	99.0475	1
21-Dec-01	25-Mar-01	700	5.36	3.8900	99.0395	0
28-Dec-02	02-Apr-02	700	5.31	3.8333	99.0338	1
04-Jan-02	08-Apr-02	700	6.64	3.8000	99.0615	0
11-Jan-02	15-Apr-02	600	6.77	3.8935	99.0386	0
18-Jan-02	22-Apr-02	400	7.33	3.8681	99.0448	0
25-Jan-02	29-Apr-02	400	7.53	3.8865	99.0403	1
01-Feb-02	07-May-02	400	6.45	3.8976	99.0271	2
08-Feb-02	13-May-02	400	6.96	3.8790	99.0422	0
15-Feb-02	20-May-02	400	6.85	3.9139	99.0336	1
22-Feb-02	27-May-02	400	7.95	3.9040	99.0361	2
01-Mar-02	05-Jun-02	400	6.30	3.9269	99.0094	0
08-Mar-02	10-Jun-02	400	7.49	3.9488	99.0251	0
15-Mar-02	17-Jun-02	400	8.36	3.9663	99.0208	1
22-Mar-02	24-Jun-02	400	7.31	4.0720	99.5000	1
28-Mar-02	01-Jul-02	400	6.46	4.0400	99.0137	0

Annex D

Achievements against objectives and highlights of the year

HM Treasury Ministers have set the DMO and published in the Framework Document, a number of strategic objectives. The objectives for 2001-02 and the DMO's performance against them are summarised in the section below.

1. To meet the annual remit set by Treasury Ministers for the sale and purchase of gilts, with high regard to long term cost minimisation taking account of risk.

- This has been successfully achieved.
- Gilt sales targets have been met through the conduct of eight outright auctions (four conventional and four index linked). Outright gilt sales were £13.7 billion (cash) split between £10.1 billion conventional and £3.6 billion index-linked gilts. For the first time since the DMO came into existence the level of planned gilt sales was increased (from £13.5 to £14.0 billion). The final outturn for gilt sales of £13.7 billion was slightly below the revised plan but within the operational tolerances allowed in the remit.
- The DMO met its buy-back target for 2001-02 (which was reduced from £1.0 billion to £0.5 billion in the Pre-Budget Report (PBR) by early December 2001). By the end of the 2001-02 financial year buy-backs totalled £0.6 billion.

2. To offset, through its market operations, the expected outturn cash flow into or out of the NLF, on every business day; and in a cost-effective manner with due regard for credit risk management.

- This has been successfully achieved. The DMO has balanced the cash flows into and out of the NLF, principally by the use of bilateral operations in the secured markets. The DMO kept within the £200 million balance it holds at the Bank of England as a source of operational flexibility to manage unanticipated cash flows which emerge late in the day. (In 2000-01 there were two occasions when the £200 million balance was breached).
- The DMO's cash management task has also been facilitated by the development of the Treasury bill market. The stock of Treasury bills in market hands rose from £3.3 billion to £9.7 billion as issuance was increased, providing an additional means of managing cash flows. This trend was in sharp contrast to 2000-01 when a planned £7.2 billion increase in the Treasury bill stock from £2.8 to £10.0 billion had been progressively reduced during the year (with the stock ending the financial year just £0.5 billion higher at £3.3 billion).

- Treasury bills have also proved a cost-effective means of managing cash flow requirements, insofar as average Treasury bill yields have been slightly below gilt GC rates.

- On 21 September 2001, as part of the preparations for increasing the level of the Treasury bill stock from October 2001 onwards, the DMO announced new arrangements for Treasury bill issuance. The main operational changes which came into effect on 5 October 2001 involved moving the close of bidding time from 12.30 pm to 11.00 am, halving the minimum size of bids at tenders to £500,000 (nominal) and increasing the minimum issuance denomination of Treasury bills to £25,000 (from £5,000).

3. To manage effectively, in accordance with objectives set by Treasury Ministers, any assets held on the Debt Management Account.

- Successfully achieved. The DMO continued to manage a short term, net cash position as an extension of its cash management operations. The cash position ended the financial year at £11.0 billion. Assets managed in line with a separate remit agreed with HM Treasury accounted for a significant part of this. The management of these assets was monitored and reported regularly to HM Treasury with reference to a benchmark. The DMO successfully met the benchmark and there were no breaches of the various risk limits set out in the remit with HM Treasury. The benchmark and risk limits are necessarily commercially confidential.

4. To advise Ministers on setting the remit to meet the Government's objectives under 1-3 above; and to report to Ministers on the DMO's performance against its remit, objectives and targets.

- The DMO contributed specific advice in a number of areas of the 2001-02 remit:
  i) The extent to which gilt issuance should be split between conventional and index-liked gilts; the case for a new medium maturity conventional gilt and the split between medium and long conventional issuance (and the maturity of new stock); and the range of contingencies in the event of changes in the Government's financing requirement (which were implemented as a result of the increased financing requirement in the PBR);
  ii) The size and timing of auctions;
  iii) Switch auction and conversion offer candidates;
  iv) The split between an increase in the Treasury bill stock and a run-down in the DMO's net cash position as elements of net short-term debt financing.

- The DMO also contributed substantially to the preparation of the *"Debt and Reserves Management Report 2002-03",* including the DMO's remit for 2002-03. Particular issues that were addressed included:
  i) Planning ahead for the conventional gilt market including the need for new short, medium and possibly long maturity conventional gilts;
  ii) The split of conventional gilt issuance between short, medium and long maturities, the split between conventional and index-linked issuance, and the possible need for a new (longer maturity) index-linked gilt;
  iii) the balance between the volume of planned gilt issuance and the level of net short term debt sales: in particular the size of the desired increase in the stock of Treasury bills; and the rate at which the DMO's net short term cash position should be wound down.

- The DMO reported performance against the remit to the Treasury on a monthly basis, and on developments in the gilt portfolio and compliance against individual published targets on a quarterly basis. The annual summary of performance against these targets is published below and in Annex K of the DMO business plan (available on the DMO web site: www.dmo.gov.uk/publications/busplan02.pdf).

5. To develop policy on and promote advances in new instruments, issuance techniques and structural changes to the debt and Treasury bill markets that may help to enhance the efficiency and lower the cost of debt and cash management, liaising as appropriate with the relevant bodies; to keep abreast of developments in debt and cash management policy and practice; and to provide policy advice to Treasury Ministers and officials accordingly.

- On 10 May 2001 the DMO published a response to its consultation document of 12 March 2001 on the conduct of index-linked switch auctions. Reactions had been supportive of the concept of such operations to switch stock out of a gilt as it falls out of a relevant maturity range in a FTSE index (to facilitate index-tracking). Accordingly, the first (and to-date only) index-linked switch auction was held on 19 July 2001 from 2% Index-linked Treasury Stock 2006 into $2^{1}/_{2}$% Index-linked Treasury Stock 2016.

- The DMO published a consultation document on the possible re-design of index-linked gilts on 7 September 2001 with a deadline for comments to be received by 31 October 2001. The main issue for consultation was whether the UK should move from the current eight-month indexation lag to a three-month lag (in common with most other sovereign issuers). The DMO published its conclusions on 15 January 2002. It decided not to introduce a new design in respect of the main issue but did make three changes to:
  i) the prospectus indexation clause, putting the onus on an independent institution to propose a satisfactory replacement index should the RPI cease to exist;
  ii) calculation of coupon and redemption amounts on new stocks, to be taken over by the DMO (the Bank of England is to retain this function for existing stocks); and
  iii) cash flows on new stocks, which will be calculated to six decimal places per £100 nominal.

- The DMO has continued to work with market participants on the introduction of mandatory quote obligations in the inter-GEMM market in a selected number of stocks. The price equivalent of the yield spreads for the quotes on the designated stocks were agreed in December 2001 and testing of new obligations began on 4 February 2002. Full imposition of the quote obligations started in May 2002.

6. To conduct its market operations, liaising as necessary with the relevant bodies, with a view to maintaining or promoting an orderly, efficient and liquid market for gilts.

- The DMO was able to issue a new medium maturity conventional gilt, 5% Treasury Stock 2012, in the current year. (Plans for such issuance in 2000-01 had been cancelled as a result of the rising cash surplus). £2.5 billion (nominal) of 5% Treasury Stock 2012 was auctioned on 24 May 2001 and this was swiftly built up to benchmark size as a result of a switch auction from $8^1/_2$% Treasury Stock 2007 on 21 June 2001 and a conversion offer from 9% Treasury Stock 2012 which was completed on 23 July 2001. These took 5% Treasury Stock 2012 up to £11 billion in issue. Other conventional issuance was exclusively of long maturity stock (5% Treasury Stock 2025).

- Until the issuance of 5% Treasury Stock 2012, all strippable stocks had coupon dates of 7 June and 7 December. One consequence has been the very substantial coupon (and redemption) payments now due on those dates each year. Following consultation with the market, the DMO introduced a second pair of coupon dates for strippable stock (7 March and 7 September) with the issuance of 5% Treasury Stock 2012.

- The DMO issued a new gilt market Operational Notice on 22 November 2001. The main changes were the withdrawal of the facility whereby the DMO would bid for short dated index-linked stocks and non-rump double-dated stocks. The DMO later confirmed that it would be prepared to bid for near maturity strips.

- The DMO operated its standing repo facility fifteen times, in response to requests from market participants.

7. To provide, including in liaison with the Bank of England and CRESTCo, a high quality and efficient service to investors in Government debt, and to deal fairly and professionally with market participants in the gilt and money markets, consistent with achieving low cost issuance and an efficient market.

- The DMO held the regular quarterly consultation meetings with GEMMs and gilt market investors to discuss their views on gilt issuance in the succeeding quarter; additional meetings were held in January 2002 chaired by the Economic Secretary to the Treasury to discuss the views of market participants on the shape of the DMO remit for 2002-03.

- On 21 September 2001 the DMO announced that a group of nine banks had agreed to act as primary participants in connection with the issuance of Treasury bills. Primary participants, as well as bidding on behalf of other investors at tenders, also agree to provide secondary dealing levels for Treasury bills for their customers.

8. To contribute to the Treasury's work on the development of the strategy for managing the Government's financial assets and liabilities.

- The first stage of a multi-simulation approach to testing the long-term risk/return trade-off characteristics of different issuance strategies has been undertaken by the DMO and was discussed with the Treasury in the context of the development of the DMO remit for 2002-03.

- This work will be advanced later in the year in light of these discussions.

9. To make information publicly available on the debt and Treasury bill markets and DMO policies where that contributes through openness and predictability to efficient markets and lower costs of issuance.

- The DMO has expanded the range of both its publications and its web site (www.dmo.gov.uk). All DMO publications and an increasing amount of data on both the gilts and cash markets are available on the web site. For details of the DMO's provision of information, see Annex L of the DMO Business Plan (available on the DMO web site: www.dmo.gov.uk/publications/busplan02.pdf)

10. To provide advice and expertise to other Government departments (and other governments) as required, and consistently with meeting the objectives 1-3 above.

- The DMO has taken forward a number of projects with other Government departments utilising the specialist financial market knowledge it has acquired in carrying out its debt and Exchequer cash management responsibilities;

- On 13 February 2002 the Department for Transport, Local Government and the Regions (DTLR) announced that the DMO was to provide a facility through the Debt Management Account (DMA), through which Local Authorities can deposit cash. The scheme is known as the DMA Deposit Facility (DMADF). A pilot scheme involving a limited number of Local Authorities started in April 2002, and will run for a number of months, during which time the demand for and feasibility of an expanded scheme will be assessed. The DMO will offer to pay a market related return for deposits as part of its existing cash management operations.

- On 7 March 2002 National Savings & Investments (NS&I) announced the launch of a new retail investment product, aimed at allowing its holders to receive a return on an equity index over a particular period – the Guaranteed Equity Bond (GEB). The GEB requires NS&I to pay a return on an equity index. This commitment needs to be hedged by means of an equity index swap. NS&I does not have the vires to execute such transactions but the DMO does, using the DMA.

- The DMO acted as an advisor on corporate bond markets to DTLR during the selection process of Lead Managers for the second stage of funding for the Channel Tunnel Rail Link, an appointment made jointly by DTLR and London & Continental Railways (LCR).

11. To resource, staff and manage the Office to deliver its objectives effectively and efficiently and to ensure value for money in its administrative expenditure.

- The DMO has continued to grow, reflecting the expansion of its responsibilities and employed 53 people by the end of the 2001-02 financial year. Also reflecting the expansion, the DMO moved to new premises on 30 July 2001.

- The DMO's annual report and audited accounts for 2000-01 were published on 18 July 2001.

- The first audited accounts of the Debt Management Account for the period 15 November 1999 to 31 March 2001 were published on 19 December 2001.

12. To develop appropriate management, information and control systems with high regard to risk minimisation; and to ensure full and accurate presentation of accounting and other information.

- Internal reporting arrangements exist and have continued to be developed to help the Chief Executive to meet his internal control responsibilities as required under the Turnbull Guidelines.

- The DMO's internal audit function has completed operational audits and provided controls related advice in accordance with the annual audit programme.

- A peer review confirmed the DMO's internal audit function was compliant with the standards defined in the Government Internal Audit Manual.

- An Electronic Records Management Systems (ERMS) Project group is reviewing and suggesting improvements to the Records Management Programme. This is designed to help enable the DMO to meet the requirements of the Freedom of Information Act, Data Protection Act, the ERM target of 2004 as well as bring the DMO into line with currently accepted best practice - the International Standard in Records Management (ISO15489), and the British Standard BS-ISO15489.

ANNEX E

Performance against published targets

In addition to the strategic objectives covered in the previous chapter, the DMO is set a number of specific targets against which to further measure performance.

Summary

The DMO had a successful fourth year meeting all its published targets with the exception of the tenth, relating to web site accuracy, but arrangements have been put in place to correct this. One treasury bill tender result was also delayed as a result of a fire alarm.

1. To ensure full compliance with the Government's remit for the DMO as set out in the Debt and Reserves Management Report 2001-02, within the tolerances and subject to the review triggers notified separately to the Office and consistently with the objectives of monetary policy.

The DMO has complied fully with the gilts remit. Eight outright auctions were held:

- £400 million (nominal) of $2^1/_2$% Index-linked Treasury Stock 2011 on 25 April 2001
- £2,500 million (nominal) of a new stock 5% Treasury Stock 2012 on 24 May 2001
- £500 million (nominal) of $2^1/_2$% Index-linked Treasury Stock 2024 on 25 July 2001
- £2,500 million (nominal) of a new stock 5% Treasury Stock 2025 on 26 September 2001
- £425 million (nominal) of $2^1/_2$% Index-linked Treasury Stock 2016 on 24 October 2001
- £2,750 million (nominal) of 5% Treasury Stock 2025 on 6 December 2001
- £500 million (nominal) of $4^1/_8$% Index-linked Treasury Stock 2030 on 24 January 2002
- £2,250 million (nominal) of 5% Treasury Stock 2012 on 27 March 2002

Together, these raised £13.66 billion (cash) toward the £14.0 billion (cash) annual target. (This target was increased from £13.5 billion in the PBR on 27 November 2001).

In addition, a switch auction of £1,400 million (nominal) of $8^1/_2$% Treasury Stock 2007 into 5% Treasury Stock 2012 was held on 21 June 2001 – increasing the size of the new stock by £1,694 million (nominal). To build up further the size of the new 2012 stock a conversion offer into it from 9% Treasury Stock 2012 was held in July.

92% of 9% Treasury Stock 2012 was converted reducing that stock to rump status[58] and increasing 5% Treasury Stock 2012 to £10,979 million within two months of it being issued.

---

[58] A rump stock is one that is too small for a liquid two-way market to be expected to exist. GEMMS are not required to quote two-way prices on rump stocks.

The first index-linked switch auction of £500 million (nominal) from 2% Index-linked Treasury Stock 2006 into $2^1/_2$% Index-linked Treasury Stock 2016 was held on 19 July 2001 – to coincide with the 2006 stock falling out of the FTSE over 5-year index. £561 million (nominal) of the 2016 stock was created.

The DMO complied fully with the cash management remit. The stock of Treasury bills increased from £3.3 billion to a peak of £11.5 billion in mid-January 2002. The end financial year target for Treasury bill stocks was increased in the PBR from £8.3 billion to £9.7 billion and was successfully met.

The DMO also continued to manage its net cash position in line with the agreed remit. The DMO's overall net cash position fell by £2.2 billion to £11 billion by end-March 2002.

2. To ensure that the maximum time taken to issue the results of gilt auctions does not exceed 40 minutes, that for structured Treasury Bill tenders does not exceed 30 minutes, and that for ad hoc Treasury Bill or other tenders does not exceed 15 minutes, whilst achieving complete accuracy.

Achieved. The gilt auction result release times during the financial year were:

25 April, $2^1/_2$% IL Treasury Stock 2011	22 minutes
24 May, 5% Treasury Stock 2012	34 minutes
21 June, switch auction into 5% Treasury Stock 2012	24 minutes
19 July, switch auction out of 2% IL Treasury Stock 2006	33 minutes
25 July, $2^1/_2$% IL Treasury Stock 2024	28 minutes
26 September, 5% Treasury Stock 2025	34 minutes
24 October, $2^1/_2$% IL Treasury Stock 2016	21 minutes
6 December, 5% Treasury Stock 2025	36 minutes
24 January, $4^1/_8$% IL Treasury Stock 2030	28 minutes
27 March, 5% Treasury Stock 2012	34 minutes

The release times for the results of the 52 weekly Treasury bill tenders held during the financial year ranged from 6 to 35 minutes and averaged 11 minutes. There were no ad hoc tenders. The result of the tender for $4^1/_8$% Index-linked Treasury Stock 2030 on 19 June was announced after 13 minutes.

The one tender to exceed the 30 minute target – the announcement of the 14 September tender after 35 minutes – was delayed due to circumstances beyond the DMO's control (a fire alarm necessitating evacuation of the DMO's offices as the tender was closing). Excluding the 14 September tender the average announcement time for tenders in the financial year was 10 minutes.

3. To achieve complete accuracy, within agreed accounting tolerances, in the recording and reporting of transactions through the Debt Management Account and in delivering money (and reconciling payments) to the NLF.

Achieved. All transactions going through the DMA have met the required standards. NLF balances are checked and agreed with them on a daily basis.

4. To acknowledge all letters and e-mail inquiries from the public within 5 working days and for at least 95 per cent to be sent a substantive reply within 2 weeks.

Achieved. 209 inquiries were received from the public by letter and e-mail in the financial year (of which 180 were e-mails). The average response time was 1.4 business days.

5. To achieve less than 8 breaches of operational market notices (excluding any breaches which the Treasury accept were beyond the control of the Office).

Achieved. There were no breaches of the operational market notices in the financial year.

6. To ensure that the qualifications that the National Audit office (NAO) have made in respect of the Gilt-Edged Official Operations Account are satisfactorily addressed in the running and presentation of the DMA; and that the 1999-2001 DMA accounts are presented to the NAO by the statutory deadline.

See response to target 3 above. The first account for the DMA for the period November 1999 to March 2001 was audited by the NAO and published on 19 December 2001.

7. To ensure that the statutory constraint on DMO market borrowing (not to exceed its deposits with the National Loans Fund (NLF) and Bank of England) is always met.

Achieved. The DMO's outstanding borrowing with the market was always below its deposits with the NLF and the Bank of England.

8. To ensure that, where there is a late change in the forecast, any necessary use of end of day borrowing or lending facilities is notified by the due time.

Achieved. Deadlines for late lending and borrowing were met.

9. To ensure that instructions to counterparties, agents and external systems are complete, accurate and timely, and that monitoring of the progress of transactions through settlement is effective, so that the DMO achieves at least 99% by value successful settlement of agreed trades on the due date.

Achieved. Total settlements turnover in the financial year 2001-02 was £576.0 billion. No trades failed as a result of circumstances within the DMO's control.

If trades which failed as a result of circumstances outside the DMO's control are included, the total of fails was £1.2 billion (or 0.21% of total turnover).

10. To achieve 100% accuracy in material published on the DMO web site (insofar as the material is under the control of the DMO and not third parties).

Twelve errors were discovered and corrected on the web site in the financial year. Of these errors one, on 14 March, was the premature release of market sensitive information on the breakdown of planned gilt sales in 2002-03.

United Kingdom
Debt
Management
Office

Eastcheap Court
11 Philpot Lane
London EC3M 8UD