

Compilation methods of the components of broad money and its balance sheet counterparts

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An article in the July 1999 edition of Bankstats introduced the concept of the Monetary Financial Institutions' consolidated balance sheet, and explained how it forms the basis for the construction of monetary statistics, more specifically of the broad money aggregate (M4) and its balance sheet counterparts. This companion article looks in more detail at the compilation methods behind the components of broad money, its sectoral breakdown and its key balance sheet counterparts (including M4 lending). In doing so, the article highlights those series within the monetary data that are subject to the greatest degree of estimation.

Background

An article in the July 1999 edition of *Bankstats*¹ showed how the broad monetary aggregate M4 and its balance sheet counterparts could be derived from the consolidated balance sheet of UK monetary financial institutions (MFIs).² The article did not, however, go into detail about the complexities involved in the compilation of the consolidated balance sheet itself, and thus of the M4 components and counterparts. The aim of this companion article is to set out the compilation methods behind the M4 components and counterparts, including the degree of estimation involved and the associated susceptibility to revision.³

History

The foundations for the compilation and publication of UK money stock data were laid by the Radcliffe Report⁴ which recommended the collection of uniform banking statistics covering all banks. Quarterly statistics on this basis were introduced in 1963. The Bank of England has been publishing broad monetary aggregates on a *monthly* basis since 1972. There have been several changes in the definition of broad money since then, partly in response to institutional and product innovations, but with the overriding aim of maintaining the relevance to monetary policy as financial markets change.

The current published monetary aggregate M4 was introduced and defined in the May 1987 Bank of England *Quarterly Bulletin* article 'Measures of Broad Money'. One of the main differences compared with its predecessor, £M3, was the inclusion of sterling monetary liabilities of building societies, in recognition of the increasing substitutability between deposits with banks and building societies. The increasing use of deposits

with building societies for transaction purposes flowed from the Building Societies Act of 1986, which, amongst other changes, allowed societies to provide a wider range of deposit products, particularly chequing accounts (it also introduced the concept of conversion to plc status, an option not previously open to societies).

The definitional changes of money measures have resulted from the recognition that there can be no unique measure of money. Any definition of money needs to be adapted to take account of financial innovation, for example as the degree of liquidity associated with particular financial instruments changes. Moreover, financial corporations may change the focus of their business in a way that justifies their inclusion in the money-creating sector, as was the case with building societies. Finally, wherever the borderline is drawn between assets that are part of broad money and those that are excluded, there may be considerable scope for substitution of assets across this borderline. In recognition of this, a separate table has been published since 1991 ('Liquid assets outside M4', *Bankstats* Table A7.1) that includes a range of assets that might be included in alternative monetary measures.

Definition of M4 and its counterparts

Definition of M4

The institutional basis underlying the monetary aggregate M4 conforms to the concept of Monetary Financial Institutions (MFIs) as defined in the European System of National and Regional Accounts 1995 (ESA95). The UK MFI sector consists of banks (including the Bank of England) and building societies operating in the UK. A third type of MFI – UK money market funds – also falls under the ESA95 MFI definition, but is excluded from the UK definition on size grounds. M4 is defined as:

- Sterling notes and coin held by the non-MFI private sector (i.e. 'M4 private sector')
- Sterling deposits of the M4 private sector with UK MFIs
- Sterling short-term paper and securities, with an original maturity of up to and including five years, issued by UK MFIs and held by the M4 private sector.

¹'Monetary statistics and the monetary financial institutions consolidated balance sheet', Sue Docker and David Willoughby, July 1999.

² For the purpose of this article, and in common with the MFI balance sheet data, UK MFIs are defined as banks (including the Bank of England) and building societies operating in the UK; owners' nationality is not implied by the title.

³ Another article in this issue – 'Assessing the reliability of monetary statistics', Chris Wright - covers revisions in more detail.

⁴ Radcliffe Report (1959) The Committee on the Working of the Monetary System.

The M4 private sector is sub-divided into ‘household sector’, ‘private non-financial corporations’ (PNFCs) and ‘other financial corporations’ (OFCs). The definitions are based on ESA95, which was implemented by the Bank of England in 1997⁵.

Within the Bank of England’s presentation of the M4 components, sterling deposits are broken down into retail and wholesale deposits. The latter includes liabilities arising under repos (sale and repurchase agreements, which involve the temporary lending of securities by the MFI in return for cash, where only the ‘cash leg’ is entered on the MFI’s balance sheet) and short-term sterling instruments. This mode of presentation is shown in the left-hand column of Table 1.

Table 1: Components of M4 (shaded)⁶

Held by these sectors	UK residents					Non-residents
	MFIs	Public sector ⁷	Other financial corps.	Private non financial corps.	Household sector ⁸	
Liabilities of MFIs			‘M4 private sector’			
£ notes and coin			M4			
£ retail deposits						
£ wholesale deposits (incl. repo and short-term instruments)						
Other £ liabilities						
FC liabilities						

FC = foreign currency

Euro-area M3

The articulation between the UK measure M4 and the euro-area broad money M3 is quite complex. The main differences are:

- **Institutional basis:** As noted above, UK money market funds’ liabilities are not part of M4, but are included in euro-area M3, where money market funds are more sizeable in some of the countries. In addition, private sector deposits with agencies of the central government are part of euro-area M3, but are not included in the broad money aggregate of the UK.
- **Currency concept:** Euro-area M3 includes euro and foreign currency deposits and instruments, in contrast to M4 which includes only sterling-denominated business.
- **Definition of the ‘money-holding’ sector:** The money-holding sector in the euro area comprises all non-MFIs resident in the euro area (except central government). It is wider than the UK definition which excludes assets held by public corporations and local government.
- **Instruments included:** Deposits and short-term securities over two years original maturity are

⁵ The ‘other financial corporations’ sector incorporates the ESA95 ‘other financial intermediaries and auxiliaries’ and ‘insurance corporations and pension funds’ sectors. It diverges from ESA95 because the UK money market funds, that are currently excluded from the MFI sector, fall into the ‘other financial corporations’ sector.

⁶ M4 is split by retail (incl. notes and coin) and wholesale, or the economic sectors but the two splits cannot currently be combined to produce, for example, PNFCs’ wholesale M4.

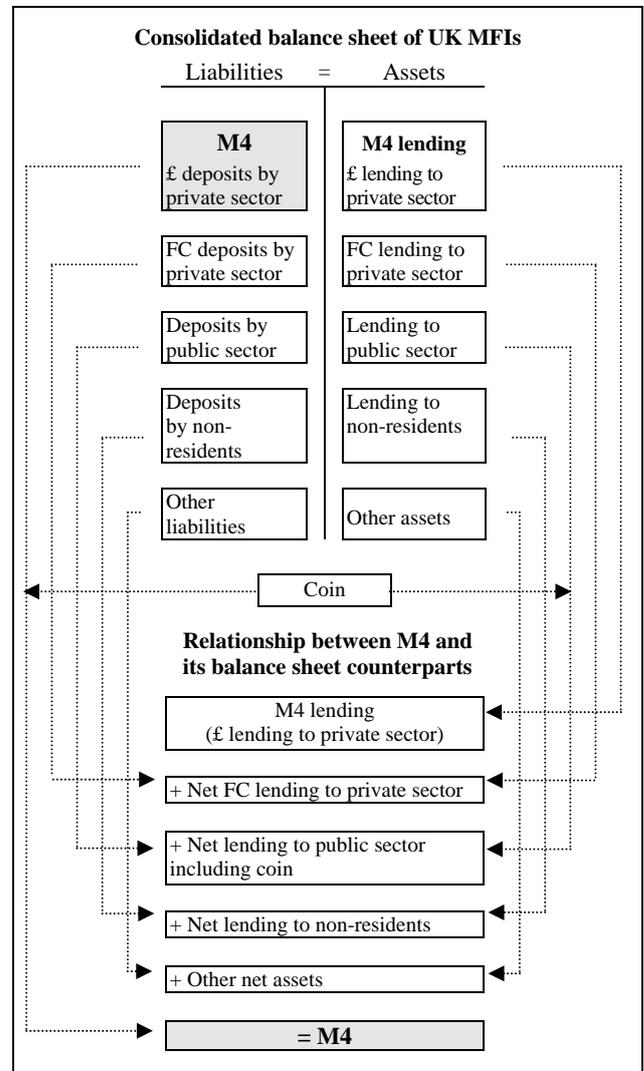
⁷ Including public corporations.

⁸ Including non-profit institutions serving households, and unincorporated businesses.

excluded from euro-area M3⁹. The M4 relevant maturity cut-off-point is five years for marketable instruments.

Since November 1999 the Bank of England has published an estimate of an aggregate for the UK that follows as closely as possible the definition of euro-area M3 (see *Bankstats* Table A2.3 – Internet version only).

Table 2: Relation between M4 and its counterparts¹⁰



FC = foreign currency

Definition of the M4 counterparts

M4 is an integral part of the liability side of the consolidated balance sheet of MFIs. It follows, therefore, that M4 can be analysed in terms of the remaining liabilities and the asset side of the balance sheet. These other balance sheet items are referred to as the ‘counterparts’ to M4. Included among these counterparts

⁹ In the case of deposits redeemable at notice, deposits with a notice period of more than 3 months are excluded from M3. However, in practice longer notice periods are virtually non-existent, with the exception of Germany.

¹⁰ The terms ‘deposits’ and ‘lending’ used in Table 2 should be interpreted in a broad sense so as to include also securities other than shares (in the case of lending also shares and other equity issues) and notes and coin (in the case of M4). Coin is the only M4 component that is external to the MFI balance sheets but is by convention added to both sides of the consolidated balance sheet to allow for a direct derivation of M4.

is MFIs' lending in sterling to the M4 private sector (referred to as M4 lending). The balance sheet counterparts can be presented in various ways (for example grouped by sector or by currency), but it is important to bear in mind that the form of presentation implies nothing about the 'cause' of movements in M4. The presentation introduced in 1999 is focused on the sectoral split and displays most of the counterpart items as net lending/assets. The currencies are given as a sub-split. Table 2, on the previous page, shows the connection between M4 and its counterparts, with the latter being presented according to the 'new' format.

General compilation issues

Before setting out the compilation methods behind the components of M4 and its counterparts on an item-by-item basis, some general compilation issues are highlighted. These are relevant for many, or even all, components of M4 and its counterparts.

Like most official statistics, M4 and its counterparts rely on incomplete information and therefore involve estimation. There are two types of estimation that are carried out when compiling M4, its sectoral breakdown and its counterparts. The first type is where the data are available to a different timetable, as is the case with the small section of banks that report quarterly data. The second is where the data are not available at all, as is the case when estimating the sectoral allocation of transit and suspense items. In the latter case, studies often form the basis for the estimation. There are some areas, such as the allocation of holdings of marketable instruments issued by MFIs, where both of these types of estimation are required.

Institutional based approach

The balance sheet data of MFIs operating in the UK is central to the compilation of monetary data. This institutional- and accounting-based approach allows in principle the derivation of high quality data, as (i) the reporting population is clearly defined and is used to producing data and (ii) the data are to a large degree directly connected with the MFIs' accounting system. Whilst the bulk of data input for the compilation of the monetary statistics, including M4 and its counterparts, can be drawn from the MFI balance sheet, some information is not available from the balance sheet and has to be estimated. This information includes sectoral detail on the holders of MFI issues of marketable instruments such as certificates of deposits, or, in the case of the Bank of England, banknotes in circulation.

Implications of quarterly reporters

Monthly balance sheet data are not collected from the full MFI population in the UK. However, the total balance sheet of the monthly reporting institutions accounts for over 99% by value (around 95% in the case of building societies) of the population's total balance sheet. The balance sheet data are grossed to represent full coverage. The grossing-up procedure for both banks and building societies is based on reported information, which is not available to the required frequency. In the case of banks, the latest available quarterly balance sheet data of the 'non-monthly reporters' are projected in the intermediate months, giving an assumed zero contribution to the flow

(change). On the availability of the next end-quarter observation, the quarterly flow is spread evenly over the past three months, which causes revisions of the 'zero flows' and the previously unchanged stocks. The Financial Services Authority provides a grossing factor for building society data, which is based on monthly information that becomes available at a later timetable than required for the regular monetary data. Again, regular revisions are made whenever the actual data become available. Due to the high monthly coverage, revisions for quarterly reporters are generally negligible.

Derivation of monetary flow series

The starting point is nearly always the difference between two levels (stocks). But the difference between successive levels does not always give a true measure of underlying activity. The aim of monetary flow series is to measure the monetary development on the basis of net transactions rather than just changes in stocks. The estimation of such 'flow series' involves adjusting the changes in stocks for 'non-transactions'. There are two types of adjustment for 'non-transactions', which can be broadly described as 'classification' (including errors in classification) and 'valuation'.

'Classification' adjustments do not pose a problem in terms of data availability, as the necessary information becomes available during the production of the data. These are:

- **Changes in the composition of the reporting population** may cause an adjustment if these involve a transfer of business into / out of the MFI sector, e.g. if a bank surrenders its permission to take deposits and becomes an 'other financial corporation'. (In many cases a bank will run down its business prior to closing down, or will transfer its business to another MFI, in which case no adjustments are required.)
- **Changes in the definitions of sectors, instrument categories, etc.** are also adjusted for, to remove the one-off break in the stock series. One major recent example was the adoption of the European System of National and Regional Accounts (ESA95) in 1997.
- **Long-term misclassifications.** For example, if a reporting institution had been misclassifying a securities dealer as a bank it would be asked to resubmit the affected returns as far back as was cost effective and an adjustment would be applied at the earliest point at which the data had been corrected.

The information that is needed to adjust for the other group of 'non-transactions', i.e. 'revaluations', is more difficult to obtain. Note that revaluation adjustments do not affect M4 itself, only the M4 counterparts. They can be sub-divided into:

- **Foreign currency revaluation adjustments** Although M4 is based on a sterling concept, its balance sheet counterparts include foreign currency positions. As UK MFIs have to report foreign currency positions in terms of sterling, a certain proportion of the changes in the associated stocks is purely caused by exchange rate movements between the foreign currency concerned and sterling between two consecutive reporting dates. In order to remove this effect, the two end-month observations are translated back into their 'original currency' using information that is collected as part of

the international suite of returns¹¹. The change between the two stocks measured in the respective foreign currency is then translated back into sterling at the average exchange rate for the period, which then gives the estimated currency-adjusted flow. It is not possible to adjust the building societies data since no breakdowns by currency are available. These data are very small.

- **Write-offs and other revaluations of loans:** Reductions (increases) in loan portfolios may be partly caused by write-offs (write-backs) and/or other revaluations of bad and doubtful loans. These amounts are adjusted for in the calculation of flows, as they are not true transactions. Information on write-offs and other revaluations of loans is reported quarterly by the larger banks. The amount of the latest quarter observations is projected in the intermediate months, which causes regular, but small, revisions at the point that data for the next quarter become available. The information on write-offs and other revaluations of loans is not grossed up for non-reporters.
- **Other revaluations of balance sheet items:** The holdings of securities in the portfolio of MFIs are subject to regular revaluations. The Bank of England aims to detect a reasonable proportion of these revaluation adjustments during the production process. Ad-hoc information on larger revaluations becomes available as part of the regular inquiries by the banks within the production process of the data. A sample of banks also report information on their purchases and sales of securities issued by different UK sectors and non-residents.

In the following description of the compilation procedures of the components of M4 and its counterparts, reference will be made to which type of 'non-transaction' is relevant.

Compilation methods of the individual components of M4

Notes and coin

Compilation of the notes and coin contribution to M4

The first step involves calculating the total value of sterling notes and coin in circulation. Notes are issued by the Bank of England's Issue Department and therefore appear on the liability side of the Bank of England's balance sheet. Banks in Scotland and Northern Ireland also issue their own bank notes, but these are almost totally backed by holdings of Bank of England notes. Coin is a liability of HM Treasury and as such external to the balance sheets of UK MFIs, but is added in to both sides of the MFI balance sheet to allow the derivation of M4. The amount of coin in circulation is provided to the Bank of England by the Royal Mint.

The second step involves deducting the amounts of sterling notes and coin held by MFIs operating in the UK from the outstanding value. The resulting residual figure contains notes and coin held by the UK public sector and by non-residents as well as the M4 private sector's holdings. Holdings by the public sector are small. An estimate of sterling notes and coin held by non-residents is obtained from the Office for National Statistics (ONS) which collects the information for use in compiling the balance of payments. The data for holdings by non-residents become available with a lag, so there are small revisions to the residual series for M4 private sector holdings when the latest quarter's non-resident data are received from the ONS.

Sectorisation of the M4 private sector's holdings of notes and coin

In the same way that the M4 private sector's total holdings has to be estimated, so does the sectoral breakdown. The current estimate is that over 90% of the total is held by the household sector and most of the remainder by private non-financial corporations (PNFCs) e.g. retailers, manufacturers etc. A small amount is allocated to 'other financial corporations' (OFCs).

Derivation of flow series for notes and coin

Within the calculation of flows, the changes between two end-month observations of the component 'notes and coin' have infrequent and generally small adjustments for changes in the composition of MFI sector (as far as their cash holdings are concerned) and for write-offs of bank notes.

Retail deposits

Compilation of the retail deposits contribution to M4

The purpose of defining a separate category 'retail deposits' within deposits is to quantify those deposit balances that are more directly related to transactions in goods and services, rather than savings. Together with notes and coin in circulation, this component makes up the current estimate of 'retail M4'.

Retail deposits are defined as those that arise from the customer's acceptance of an advertised rate of interest (including zero i.e. non-interest-bearing). The distinction between 'retail' and 'wholesale' is therefore drawn on the degree of 'market power' of the customer. The definition is quite difficult to maintain in practice as products change. As a rule, the Bank of England regards all non-interest-bearing deposits as 'retail deposits'; together with those interest-bearing deposit products that are placed at an advertised rate of interest. Typically, 'retail deposits' are taken in the banks' branch networks on the grounds of an existing or new customer relationship. The rates of interest may not be directly linked to interbank rates, and are advertised or displayed at the branch counter, on a bank's internet site, or are part of standard tariff terms so that depositors can establish, without further enquiry, the rate applicable to each type of deposit.

A more precise legal definition existed for building societies. Retail deposits with building societies were defined in section 7 of the 1986 Building Societies Act prior to October 1998. Since a new suite of building society reporting forms was introduced in 1998, as a consequence of revised legislation, retail deposits with

¹¹ The information covers all the items on the balance sheet but not to the same degree of detail i.e. some items are grouped together. For each of these groups of balance sheet items, the amount, which is in each of the reported currencies, is calculated and these form the 'proportions', which are applied to each of the applicable balance sheet items. Having applied the weights, the resulting amounts are translated using the appropriate exchange rate for the currency and reporting date.

building societies have been defined according to the sector of the customer by including all deposits of individuals and 'shares' held by the private sector. Almost the entire amount of building societies' deposits falls under the 'retail' category.

The first step in the calculation of this component is to add up non-interest-bearing deposits of the UK private sector, identifiable from the consolidated balance sheet of the MFIs operating in the UK. Thereafter, the 'retail' part of interest-bearing deposits is obtained from additional off-balance sheet information submitted by MFIs.

Transit and suspense item allocation

Suspense items relate to funds of customers that are not held in their names and are therefore not classified as institutions' positions vis-à-vis the customer e.g. share over-subscription. Hence, current accounts and debts of customers would be either under- or overstated (depending on whether it is a credit or a debit suspense balance) unless suspense items are allocated to the sectors of the customers to which they relate.

Transit items appear in banks' balance sheets as both credits and debits; they are the result of cheques, giro transfers, etc that are held within the clearing system at the end-month reporting date. Cheques in the course of collection cause an overestimation (underestimation) of sight deposits (overdrafts). This is because the payee's account is normally credited immediately after paying in the cheque (even if it cannot be drawn against), whereas the drawer's account is debited a couple of days later, i.e. after the cheque has cleared. Until the cheque clears, the funds involved are therefore shown on the balance sheets of both the payee and the drawer. On the other hand, the amounts of sight deposits (overdrafts) would be understated (overstated) in the case of unsettled giro transfers, given that the funds involved do not appear on either party's account until the payment is fully settled. This is because the payer's account is immediately debited, whereas the recipient's account is credited later.

The next step of the compilation of the component 'retail deposits' involves an allocation of these transit and suspense balances (for which no sectoral information is available) to the non-interest-bearing part of retail deposits. The aim of this 'transit adjustment' is to remove the double recording (or under-recording) of sterling sight deposits, which would otherwise result from items in suspense and transit.

The 'adjustment' made to remove these effects on current account balances is quite complex. It involves adding credit transit and suspense items to the current account balances and deducting debit transit and suspense items.¹² The difficulty of this correction derives from the need to:

- Distinguish the sectors of the customers to whom the transit and suspense balances belong.
- Estimate whether this 'adjustment' reduces/increases a credit balance, i.e. a sight deposit, or increases /reduces a debit balance, i.e. an overdraft.

This is done in order to integrate the adjustment fully into the monetary statistics framework and to allocate transit

and suspense items appropriately to the M4 component 'retail deposits' and the different M4 counterparts. In doing so, it must also be taken into account whether the transit and suspense items are in sterling or foreign currency (this split is available).¹³ The 'transit adjustment' for the component 'retail deposits' involves the allocation of sterling transit and suspense items relating only to the sterling-based definition of M4. The percentages for this 'adjustment', shown in Table 3, are drawn from an internal study on this subject. They have been applied since October 1986.

Table 3: Transit and suspense item 'adjustment' for the component 'retail deposits'

	Sterling current accounts in credit (=sight deposits) with banks			
	OFCs	PNFCs	House- hold sector	Total M4 private sector
£ Transit items				
Credit	7.2%	7.2%	56.0%	70.4%
Debit		-24.0%	-48.0%	-72.0%
£ Suspense items				
Credit	30.0%	9.0%	28.0%	67.0%
Debit	-33.0%	-6.0%	-28.0%	-67.0%

No similar 'adjustments' are required for building societies because they represent 'uncleared cheque' business with banks and do not therefore give rise to double-counting.

Wholesale deposits

Compilation of the wholesale deposits contribution to M4

The calculation of 'wholesale deposits' involves the summing of all M4 private sector sterling deposits other than those defined as 'retail', the M4 private sector's holdings of marketable instruments of up to and including five years' original maturity (issued by MFIs operating in the UK), sterling bank bills held by the M4 private sector and the majority of the inter-MFI difference. The inclusion of marketable instruments follows a broad interpretation of the term 'deposits' in recognition of the high degree of substitutability between 'direct deposits' and holdings of MFI securities. All of these items require some estimation, the 'direct deposits' item only requires a minimal amount of temporary estimation relating to quarterly reporting institutions' data, but the other three items have allocation issues arising from lack of information on, for example, which sectors are holding the instruments.

The main part of the 'direct deposits' within 'wholesale' is calculated by residual, by simply deducting the M4 private sector's sterling 'retail interest-bearing deposits' from the M4 private sector's total sterling interest-bearing deposits as identified in the consolidated balance sheet of the MFIs. MFIs' liabilities arising from repos with the M4 private sector (i.e. where the M4 private

¹² Credit and debit items of transit and suspense items are reported by the UK MFIs to the Bank of England.

¹³ M4 counterparts are affected in the case of foreign currency transit and suspense items, or to the extent that sterling transit and suspense balances relate to overdrafts or sight deposits held by the public sector or non-residents.

sector places cash temporarily with MFIs) are added to this figure.

Second, the part of marketable sterling CDs (certificates of deposit), CP (commercial paper) and other short-term MFI issues with an original maturity of up to, and including, five years, is added. Following the M4 definition, again, only those instruments that are estimated to be held by the M4 private sector are included. The allocation of instruments to the different sectors has similar measurement issues to notes and coin. Since these instruments are traded on secondary markets, MFIs cannot report which sector is holding those that they have issued. The solution devised is a combination of directly reported supplementary information and a proportion of the unallocated or residual amount. Table 4 shows this procedure.

Table 4: Sectoral allocation of the holders of sterling CDs, CP and other instruments ≤ 5 years original maturity issued by MFIs operating in the UK

Step	Source
Outstanding CDs, CP and other instruments ≤ 5 yrs. issued by UK MFIs	Balance sheets of UK MFIs
– UK MFIs' holdings	Balance sheets of UK MFIs
– Estimate of UK public sector holdings	Debt Management Office
– Holdings by various OFCs and PNFCs	ONS (to a different timetable - projections needed)
– UK-operating banks' (including the Bank of England's) custodial holdings of instruments owned by non-residents	Supplementary off-balance sheet information from banks on custody holdings lodged by non-residents
= Residual amount allocated to OFCs, PNFCs, household sector and non-residents	

The calculation involves deducting the holdings by MFIs from the entire amount of outstanding sterling issues. The resulting net figure, i.e. non-MFI holdings, can be taken directly from the consolidated balance sheet of the UK MFIs, as MFIs' holdings are identifiable from the balance sheets of the banks and building societies operating in the UK. The holdings by the Debt Management Office (DMO), which is believed to account for the greatest part of public sector holdings, is provided by the DMO itself. This figure is also deducted. The known holdings by the OFC and PNFC sectors, provided by the ONS, are then deducted. Finally, UK-operating banks' (including the Bank of England's) custodial holdings of the instruments owned by non-residents are deducted. This information is reported as supplementary balance sheet information on a monthly basis by banks. This leaves a 'residual amount' for these instruments¹⁴. This unallocated amount reflects the gap in the directly reported information, which does not, for instance, cover non-resident holdings under custody with banks operating abroad. The residual item is allocated to the sectors OFCs, PNFCs, household sector and non-residents by applying pre-determined

proportions based largely on joint Bank of England/ONS work using evidence from 'hard' reported data. The M4-relevant part of these instruments is then calculated by simply aggregating the known holdings by OFCs and PNFCs and then adding the quantitative amounts that are allocated to OFCs, PNFCs and the household sector from the 'residual amount'.

The ONS data, from which the information on MFI sterling issues in the hands of OFCs and PNFCs is derived, are not available to the same timetable and frequency as the MFI-reported and public sector data (quarterly data, about one month in arrears). So again, as is necessary for the sectorisation of notes and coin holders, the Bank of England carries out projections until the ONS data are available. On receipt of these data, the earlier projected figures are revised. The procedure regularly results in a change to the residual item. Therefore both the directly available amount of OFCs' and PNFCs' holdings as well as the part that is assigned from the 'residual amount' to OFCs, PNFCs, the household sector and non-residents, will be affected by the revisions. The revision of sectoral information on the instruments' holders is one of the main causes for revisions to M4. Another article in this issue - *Assessing the reliability of monetary statistics* - covers this and other revisions issues in more detail.

The difficulty in accurately measuring the holdings of marketable instruments within the broad monetary aggregate is faced by other central banks, such as the Eurosystem. The impact is however limited in the UK, in that the main part of non-resident holdings (a difficult amount to quantify) is believed to be denominated in foreign currency, which is excluded from UK broad money, in contrast with euro-area M3.¹⁵

The next step in the calculation is to approximate the proportion of sterling bills accepted by UK-operating banks and held by the M4 private sector (the 'bill leak') and add it to the component 'wholesale deposits'. It is estimated by firstly deducting MFIs' holdings (which are available from their balance sheets) from outstanding bank bills. A great majority of sterling bank bills are held within the UK banking system. Secondly, the non-resident holdings under custody with UK MFIs are deducted from this comparatively small residual amount. These custody holdings are currently nil. The residual figure, i.e. the 'bill leak', is understood to be a sufficiently accurate measure for the M4 private sector's holdings of bills, given that non-resident holdings are not considered significant.

The final step involves allocating 95% of the sterling inter-MFI-difference to this component i.e. the net excess / deficit of reported inter-MFI liabilities over inter-MFI claims. Prior experience has shown that balances with securities dealers (which should be classified as OFCs and therefore not MFIs) can be erroneously classified as balances vis-à-vis MFIs and vice versa, especially when the securities dealer has a similar name to a parent bank or a bank within the same company group. This misclassification leads, if not corrected, to an

¹⁴ It should be noted, that the ONS information on holders of CP and other instruments up to and including five years' original maturity is somewhat less detailed than described above (for CDs) so that the 'residual amount' is relatively larger in these cases.

¹⁵The Eurosystem has developed an estimation procedure for the proportion of negotiable MFIs' instruments that are held by non-euro-area residents. The revised euro-area M3 figures were initially disseminated in November 2001.

underestimation or overestimation of the level of OFC deposits, and thus M4. In turn, it causes a sterling inter-MFI difference because this wrongly classified position cannot be offset while drawing up the consolidated balance sheet of the UK MFIs, because the ‘mirror position’ from the OFC is not reported. In fact, a considerable part of the sterling inter-MFI-difference, estimated to be 95%, is attributed to the misclassification of OFC deposits as MFI business or vice versa, according to the results of a detailed investigation of the causes of the inter-MFI difference (see page 101 *Economic Trends*, ONS, issue 464, June 1992). In order to eliminate this effect, 95% of the sterling inter-MFI difference is added to OFCs’ (and wholesale) deposits. The remaining 5% is associated with transit items. The majority of this impacts upon M4 via the transit adjustment, and the remainder on M4 lending. At end-August 2002, the sterling inter-MFI difference amounted to about £1bn (in the amount outstanding of M4 of over £980bn).

Table 5 summarises the compilation issues relating to the components of M4. It shows the source of the data, and records whether or not estimation is involved.

Sectorisation of the M4 private sector’s sterling deposits

Sectorisation is only carried out for total M4 private sector sterling deposits. The breakdown into ‘household sector’, ‘PNFCs’ and ‘OFCs’ can be easily derived from

the balance sheets of MFIs as far as ‘direct deposits’ are concerned, but is not available for the ‘retail’ and ‘wholesale’ elements separately.

Derivation of flow series for the M4 private sector’s sterling deposits

Changes in stocks are adjusted for changes in the composition of the MFI sector, long-term misclassifications and definitional changes. Definitional changes are not only restricted to the sector classification but may also arise whenever changes in the definition of ‘retail deposits’, and therefore ‘wholesale deposits’ (as this is a residual) occur.

Compilation methods of the balance sheet counterparts of M4

M4 lending

Compilation of M4 lending

As was shown in Table 2, in the same way that M4 is the MFIs’ sterling liabilities to the M4 private sector, M4 lending is the MFIs’ sterling claims on (assets) the M4 private sector. It comprises sterling loans (and sterling securities) in the portfolio of MFIs that have been extended to (or issued by) the M4 private sector.

Table 5: Compilation of the different components of M4

Component	Calculation	Source	Estimate?
Notes and Coin	Sterling notes and coin in circulation	Notes: BoE (Issue Dept); Coin: HM Treasury	No
	– Sterling notes and coin held by MFIs	MFI balance sheet data	No
	– Sterling notes and coin held by non-residents	ONS (not to same timetable or frequency)	Yes
	– Sterling notes held by UK public sector	ONS (not to same timetable or frequency)	Yes
Retail deposits	Non-interest bearing sterling deposits of M4 private sector	MFI balance sheet data	No
	+ Retail interest bearing sterling deposits of M4 private sector	MFI balance sheet data; additional MFI information on amount of retail interest-bearing deposits	No
	+ 70.4% of sterling credit transit items	MFI balance sheet data (percentage from study)	Yes
	+ 67% of sterling liability items in suspense ¹⁶	MFI balance sheet data (percentage from study)	Yes
	– 72% of sterling debit transit items	MFI balance sheet data (percentage from study)	Yes
	– 67% of sterling asset items in suspense	MFI balance sheet data (percentage from study)	Yes
	+ 3.7% of sterling inter-MFI difference	MFI balance sheet data (percentage from study)	Yes
Wholesale deposits	Interest-bearing sterling deposits of M4 private sector	MFI balance sheet data	No
	– Retail interest-bearing sterling deposits of M4 private sector	MFI balance sheet data	No
	+ 95% of sterling inter-MFI difference	MFI balance sheet data (percentage from study)	Yes
	+ UK MFI issues of sterling CDs, CP and other short-term paper ≤ 5 years original maturity held by various groups of OFCs and PNFCs	ONS information (different timetable and frequency)	Yes
	+ Part of the residual amount of these instruments that cannot be directly allocated to holders	Residual amount: MFI balance sheet data, Custody data of MFIs, ONS data, DMO data	Yes
		Allocation residual amount: Joint BoE-ONS study	
	+ Outstanding sterling bank bills	MFI balance sheet data	No
	– Holdings of these instruments by UK MFIs (main part)	MFI balance sheet data	No
	– Non-resident holdings of these instruments under custody with UK MFIs	Custody information of UK MFIs	No

The asset-side counterparts of M4 are in general less exposed to sectoral measurement issues, because MFIs know exactly who their loan recipients are and who are the issuers of the securities in their portfolio. M4 lending

can therefore be derived more straightforwardly from the balance sheet returns than M4. However, the same qualification exists with respect to transit and suspense item adjustments as for M4.

¹⁶ Including cash-loaded smart cards.

The starting point for the compilation of 'M4 lending' is the loans that banks (including the Bank of England) and building societies operating in the UK have granted to the M4 private sector, i.e. the household sector, PNFCs and OFCs, which are identifiable from the consolidated balance sheet of UK MFIs. Reverse repos, involving MFIs taking securities for a pre-defined period against the loan of funds to the M4 private sector, are also included.

The next step involves adding MFI holdings of securities issued by the M4 private sector, such as CP (commercial paper), bills, bonds (irrespective of maturity), shares and other equity issues. These holdings can be identified by the MFIs and are reported to the Bank of England. Banks' M4 private sector acceptances are added to M4 lending.

The final step of the compilation of the 'M4 lending' is the allocation of sterling transit and suspense balances. The reason for this adjustment has been set out in detail in the section on 'retail deposits'. To the extent that balances on M4 private sector's sterling current accounts are negative, i.e. overdrafts, 'M4 lending' is also affected by under-recording (overstating) arising from uncleared cheques (giro transfers). The proportions that are applied to remove these effects are given in Table 6.

Table 6: Transit and suspense item 'adjustment' for the component 'M4 lending'

	Sterling current accounts in debit (=overdrafts) with banks			
	OFCs	PNFCs	House- hold sector	Total M4 private sector
£ Transit items				
Credit	-4.8%	-4.8%	-14.0%	-23.6%
Debit		16.0%	12.0%	28.0%
£ Suspense items				
Credit	-20.0%	-6.0%	-7.0%	-33.0%
Debit	22.0%	4.0%	7.0%	33.0%

In the opposite way to the 'transit adjustment' for 'retail deposits', sterling credit transit and suspense items are deducted from 'M4 lending', whereas sterling debit items are added. Again, no 'transit adjustment' is necessary for building societies.

As the final step, a small proportion of the difference between inter-MFI sterling liabilities and assets (i.e. sterling inter-MFI difference) is subtracted from M4 lending within the 'transit adjustment'. As was mentioned in the section 'wholesale deposits', this reflects the results of a detailed investigation of the causes of the inter-MFI difference.

Sectorisation of M4 lending

The subdivision of 'M4 lending' into the sectors 'household sector', 'private non-financial corporations' and 'other financial corporations' poses no measurement issues aside from transit and suspense allocation. MFIs can provide a sector breakdown for their loans, acceptances and securities holdings in a timely and reliable fashion.

Derivation of flow series for M4 lending

Changes in stocks are adjusted for changes in the composition of the MFI sector, long-term misclassifications and definitional changes. Unlike M4, M4 lending is also adjusted for revaluations of MFI holdings of sterling securities issued by the M4 private sector and write-offs of sterling loans to the M4 private sector (as was mentioned in the 'general compilation issues' section, M4 lending flows are subject to regular, although not particularly large, revisions arising from the quarterly availability of the additional data e.g. write-offs required for this purpose).

Net foreign currency lending to the M4 private sector

Compilation of net foreign currency lending to the M4 private sector

As is the case with M4 and M4 lending, the counterpart 'net foreign currency lending to the private sector' refers to positions with the M4 private sector, the main difference being that only foreign currency positions are included in this counterpart. It is calculated by summing up foreign currency loans to M4 private sector (including those via reverse repo) and MFI holdings of foreign currency securities issued by the M4 private sector (including shares and other equity issues). It can be seen from Table 7 that only foreign currency suspense balances are assumed to have an impact on foreign currency overdrafts.

Table 7: Suspense item 'adjustment' for the loan part of the component 'Net FC lending to private sector'

	FC current accounts in debit (=overdrafts) with banks			
	OFCs	PNFCs	House- hold sector	Total M4 private sector
FC Suspense items				
Credit	-12.0%		-1.0%	-13.0%
Debit	14.0%			14.0%

FC = foreign currency

Foreign currency deposits of the M4 private sector are then deducted from the lending figure. 'Direct foreign currency deposits' (including repos) are subtracted. Only foreign currency suspense balances are believed to have an impact on foreign currency sight deposits, as shown in Table 8.

Table 8: Suspense item ‘adjustment’ for the deposit part of the component ‘Net FC lending to private sector’

	FC current accounts in credit (=sight deposits) with banks			
	OFCs	PNFCs	House- hold sector	Total M4 private sector
FC Suspense items				
Credit	18.0%		4.0%	22.0%
Debit	-21.0%			-21.0%

FC = foreign currency

The M4 private sector’s holdings of short-term foreign currency securities issued by MFIs operating in the UK are deducted. This poses the same allocation problems as sterling marketable instruments within M4. The same type of estimation procedure is applied, and lags in receiving quarterly data again cause revisions.

Finally, 40% per cent of the foreign currency inter-MFI difference is added to this component in an attempt to neutralise misclassifications.

Sectorisation of net foreign currency lending to the M4 private sector

The same foreign currency sectoral information on depositors and borrowers is available from the MFI balance sheet as is available for their sterling equivalents. Estimates for the sectors’ holdings of MFIs’ marketable instruments are calculated using a similar procedure to that for M4. The suspense item allocation is detailed in Tables 7 and 8 above. The sectoral breakdown of these counterparts, and their sterling equivalents, are shown in *Bankstats* Table B2.1.1.

Derivation of flow series for net foreign currency lending to the M4 private sector

In addition to those adjustments (and resulting revisions in the case of lagged data) listed under M4 and M4 lending, changes in stocks are adjusted for exchange rate effects. The exchange rate adjustment procedure has been set out in the section ‘general compilation issues’. It is not possible to exchange rate adjust the building societies data as no breakdown by currency is available.

Net sterling lending to the public sector (including coin)

Compilation of net sterling lending to the public sector

The lending part is calculated by deriving the amount of sterling loans to the public sector, including those via reverse repo, and MFI holdings of sterling securities issued by the public sector from the balance sheet of the MFIs. In the context of the ‘transit adjustment’, 2.4% of credit sterling transit items are then deducted from this figure.

The second step involves the deduction of the public sector’s sterling deposits (including those via repo). These also include the proportion of sterling MFI instruments held by the public sector (reported by the DMO). The public sector ‘direct deposits’ can be derived from the MFI balance sheet. The ‘transit item adjustment’ increases the sterling public sector deposits (which are then deducted from sterling loans to obtain the net figure) by 3.6% of the sterling credit transit items.

A peculiarity that should be noted, is that the amount of coin that is estimated to be held by the M4 private sector is also included. It constitutes the counterpart balance sheet entry of the M4 component coin, which is, as mentioned in the ‘notes and coin’ section of this article, added to the consolidated balance sheet of UK MFIs to allow the calculation of M4. The counterpart balance sheet entry for coin is allocated to ‘Net sterling lending to public sector’ to reflect the fact that coin is a liability of HM Treasury.

Derivation of flow series for net sterling lending to the public sector

Adjustments made to sterling lending to and deposits from the public sector are similar to those made to M4 and M4 lending.

Net foreign currency lending to public sector

The derivation of this component follows broadly the same procedure as for the component ‘net sterling lending to the public sector’. However, there are the following exceptions:

- No ‘transit item adjustment’ is performed for these balances as the effects are assumed to be nil
- Coin is not included within the foreign currency part of net lending to the public sector
- An exchange rate adjustment procedure is carried out for the purpose of deriving flows

Net sterling lending to non-residents

Compilation of net sterling lending to non-residents

The compilation is very similar to net sterling lending to the public sector. It involves calculating the amount of sterling lending to non-residents, which consists of sterling loans to non-residents (including via reverse repo) and MFI holdings of sterling securities issued by non-residents (including shares and other equity issues). This information can be directly derived from the balance sheets of the MFIs. No ‘transit item adjustment’ is carried out, as the implications for this category are thought to be negligible.

The next step involves deducting the overall amount of non-resident sterling deposits from this figure. The ‘direct non-resident sterling deposits’ (including via repo) can be derived from the balance sheets of the MFIs. It was mentioned within the section ‘wholesale deposits’ that the estimation of the non-resident holdings of marketable instruments consists of reported information (UK MFI custody holdings of these instruments lodged by non-residents) and a proportion of the unidentifiable ‘residual part’ of MFI sterling instruments which is based on an earlier study. No ‘transit item adjustment’ is made.

Derivation of flow series for net sterling lending to non-residents

Adjustments made to sterling lending to and deposits from non-residents are similar to those made to M4 lending and M4.

Net foreign currency lending to non-residents

The derivation of this component follows broadly the same procedure as for the component 'net sterling lending to non-residents'. However, there are the following exceptions:

- A 'transit item adjustment' is performed: 26% of the foreign currency debit suspense items are added to loans to non-residents, and 26% of the foreign currency credit suspense items are deducted. As far as deposits of non-residents are concerned, (which are deducted from the loans to obtain a net figure), 39% of the foreign currency credit suspense items are added, whereas 39% of the foreign currency debit suspense items are deducted. All of the foreign currency credit transit items are added to, and all of the foreign currency debit transit items are subtracted from, non-resident deposits.
- 60% per cent of the foreign currency inter-MFI difference is added in an attempt to neutralise misclassifications.
- An exchange rate adjustment procedure is carried out for the purpose of deriving flows

The M4 counterpart compilation issues discussed above are summarised in Table 10 on the following page.

Other net assets

Compilation of other net assets

This contains all those balance sheet items that are not covered by the previous counterparts. These are assets and liabilities that, with the exception of some inter-MFI investments, cannot be related to any customer. It also includes liabilities of longer original maturity than is defined in some of the broad money components. The calculation therefore involves summing the remaining assets from the consolidated balance sheet. Examples of other assets are holdings of gold bullion, fixed assets (such as commodities owned), accrued receivables and investments in other UK-operating banks. Thereafter the overall amount of 'residual liabilities', which consists of capital and other funds, is deducted.

Derivation of flow series for other net assets

Changes in stocks are adjusted for changes in the composition of the reporting population, long-term misclassifications, definitional changes and changes in the capital item that have been caused by write-offs or write-downs of bad and doubtful loans, revaluations of securities holdings and foreign currency investments.¹⁷

Publication of the M4 components and counterparts

Table 9 shows where the M4 components and counterparts including the sectoral breakdowns can be found in *Bankstats*.

Table 9: Publication references to the components of M4 and its counterparts

Data	Bankstats table
Components of M4: changes and amounts outstanding	A2.2
MFI balance sheet counterparts to changes in M4	A3.1
Monthly sectoral analysis of M4 & M4 lending: seasonally adjusted	A4.1
Monthly sectoral analysis of M4 & M4 lending: not seasonally adjusted	A4.2
Quarterly sectoral analysis of M4 & M4 lending: seasonally adjusted	A4.4
Quarterly sectoral analysis of M4 & M4 lending: not seasonally adjusted	A4.5
Central bank's balance sheet (Bank of England 'Bank return')	B1.1
Other banks' balance sheet	B1.2
Building societies' balance sheet	B1.3
Monetary financial institutions' consolidated balance sheet	B2.1
Monetary financial institutions' consolidated balance sheet – further sectoral breakdown	B2.1.1
Write-offs and other revaluations of loans by banks	C2.1

¹⁷ Any revaluation adjustment that is applied on assets of MFIs, such as securities holdings, implies a counterpart adjustment of the position 'other capital and other funds'.

Table 10: Compilation of the MFI balance sheet counterparts of M4 where sector is known or estimated¹⁸

	M4 lending	Net foreign currency lending to the M4 private sector	Net sterling lending to the public sector	Net foreign currency lending to the public sector	Net sterling lending to non-residents	Net foreign currency lending to non-residents
Lending	Sterling loans by MFIs to the M4 private sector + MFIs' holdings of sterling securities issued by the M4 private sector - 23.6% of sterling credit transit items - 33% of sterling liability items in suspense + 28% of sterling debit transit items + 33% of sterling asset items in suspense - 1.3% of the sterling inter-MFI difference	FC loans by MFIs to the M4 private sector + MFIs' holdings of FC securities issued by the M4 private sector - 13% of FC liability items in suspense + 14% of FC asset items in suspense	Sterling loans by MFIs to the public sector + MFIs' holdings of sterling securities issued by the public sector - 2.4% of sterling credit transit items + Coin	FC loans by MFIs to the public sector + MFIs' holdings of FC securities issued by the public sector	Sterling loans by MFIs to non-residents + MFIs' holdings of sterling securities issued by non-residents	FC loans by MFIs to non-residents + MFIs' holdings of FC securities issued by non-residents - 26% of FC liability items in suspense + 26% of FC asset items in suspense
		<i>subtract:</i>	<i>subtract:</i>	<i>subtract:</i>	<i>subtract:</i>	<i>subtract:</i>
Deposits	<i>See Table 5 for M4</i>	FC deposits of the M4 private sector + UK MFI issues of FC CDs, CP and other short-term paper held by various groups of OFCs and PNFCs + Part of the residual amount of these instruments that cannot be directly allocated to holders + 22% of FC liability items in suspense - 21% of FC asset items in suspense + 40% of the FC inter-MFI difference	Sterling deposits of the public sector + UK MFI issues of sterling CDs, CP and other short-term paper known to be held by the public sector + 3.6% of sterling credit transit items	FC deposits of the public sector + UK MFI issues of FC CDs, CP and other short-term paper known to be held by the public sector	Sterling deposits of non-residents + UK MFI issues of sterling CDs, CP and other short-term paper lodged with UK MFIs on behalf of non-residents + Part of the residual amount of these instruments that cannot be directly allocated to holders	FC deposits of non-residents + Part of the residual amount of FC CDs, CP and other short-term paper that cannot be directly allocated to holders + 100% of FC credit transit items + 39% of FC liability items in suspense - 100% of FC debit transit items - 39% of FC asset items in suspense + 60% of the FC inter-MFI difference + Outstanding FC bank bills

FC = foreign currency
¹⁸ Not including the 'net other assets' item