

# Loans and Deposits from Banks Included in Experimental Corporate Services Price Index

Joanne Allen

Business Prices and Sales Division

Office for National Statistics

Room 1.133 Government Buildings

Cardiff Road

Newport, NP10 8XG

Tel: 01633 813069

E-mail: joanne.allen@ons.gov.uk

## Summary

An experimental Corporate Services Price Index (CSPI) to cover loan and deposit services from UK banks has been developed jointly by the Office for National Statistics (ONS), the Bank of England (BoE) and the British Bankers' Association (BBA). The banking CSPI is not intended to be a proxy for all banking services.

- The banking CSPI is an estimate of price movements in the service element of these products and so aims to strip out the funding element. It is therefore the charge which banks make for acting as intermediary between providers and users of funds and for a range of associated services. Given this is not explicitly charged for, but is incorporated within the margins between interest rates for loans and deposits, the methodology used is based mainly on interest data supplied by banks to the BoE.
- The banking CSPI was published for the first time on 20 February 2004, for 1999 Q1 onwards.
- The banking CSPI series depicts an overall positive growth rate over the period covered.

## Introduction

This article is one of three detailing recent developments to the CSPI. It explains the scope of the banking CSPI, describes the joint working group, consisting of representatives from the ONS, the BoE and the BBA, and indicates the data sources. It then describes the pricing methodology applied to the banking CSPI, illustrates the

resulting series and discusses the issues surrounding the current approach.

The rebasing article in this series of three articles gives a brief overview of the CSPI, describes the methods used to rebase the CSPI to the year 2000 and explains various other developments (Barford and Fenton, 2004). The other article describes the redevelopment of the business telecommunications CSPI (Hermiston, 2004).

The CSPI for UK banking services, the rebased top-level CSPI and the redeveloped business telecommunications CSPI (along with these articles) were first published on 20 February 2004 in the *Experimental Statistics* section of the *National Statistics* website ([www.statistics.gov.uk/cspi](http://www.statistics.gov.uk/cspi)).

## Part 1 - Scope

A wide range of banking and other financial intermediation services are provided by banks to businesses. In seeking to measure price movements in the banking sector, it was decided that a joint working group, consisting of representatives from the ONS, the BoE and the BBA, would undertake the development work and that the group would concentrate initially on the loans and deposit services provided by UK banks to corporate customers. The banking CSPI outlined in this article should not be regarded as a proxy for all banking services. However, the work undertaken by the group and the understanding acquired during the development process provide a strong foundation for the investigation of possible future developments of the banking CSPI, beyond loans and interest bearing deposits.

In terms of the SIC (Standard Industrial Classification), the sector targeted in the current banking CSPI is SIC 65.12/1 (i.e. the Banks subsection of 65.12: Other monetary intermediation). Note that SIC 65 covers *Financial Intermediation, Except Insurance and Pension Funding*.

## Part 2 - The Joint Working Group

In the early development of the banking CSPI, a joint working group was set up. There were several reasons for this. Firstly, it was recognised that the ONS should work jointly with the BoE and the BBA to achieve a successful mix of technical expertise to ensure an appropriate index. Given the charging for loan and deposit services was not explicit, but at least partly included within interest charges, it was clear that a sound knowledge of banking services would be required to develop a suitable proxy. It was also recognised that some data were collected by the BoE that could be used to develop a methodology for estimating price data. Confidentiality of the data collected and held by the BoE was another issue that dictated the necessity of BoE involvement in the development of the price index.

## Part 3 - Data Sources

The BoE collects data, both for financial policy monitoring and for the ONS National Accounts. This includes data on average interest rates and banks' income and expenditure. Although the data from the BoE have been utilised in the calculation of the banking CSPI, their returns do not yield all the data needed. However, in the future, data from new BoE returns will go further in meeting the requirements.

## Part 4 - Banking CSPI Pricing Methodology

### Overview

As mentioned in the previous sections, the banking CSPI outlined in this article utilises data from the statistical returns collected by the BoE. Data from the ONS Inter-Departmental Business Register (IDBR) are also utilised, for adjustment purposes (explained later). The statistical returns collected by the BoE include data on loans and deposits, interest earned and interest paid. Fees earned from lending services have been estimated. Such data have supported an approach based on the principles of FISIM (Financial Intermediation Services Indirectly Measured). If required, general

background information on FISIM can be found on the United Nations Economic Commission for Europe website at <http://www.unece.org/stats/documents/ces/ac.68/2001/4.e.pdf>

Banks often provide services for which they do not explicitly charge. Paying or charging different rates of interest to lenders and borrowers covers the cost of providing these services and generates an operating surplus. This scheme of interest rates avoids the need to charge customers explicitly for many of the services provided. It has therefore been necessary to derive an estimate for the service income, based on the interest margin together with explicit fees. It is recognised that the interest margin will also cover other costs such as the risk of default. We have assumed that these remain constant over time.

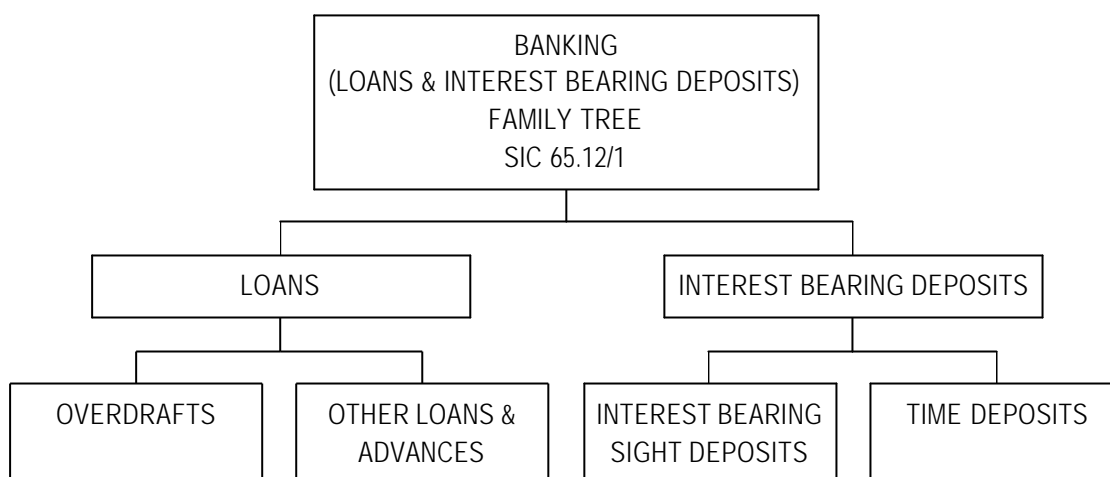
From the data collected by the BoE, it has therefore been possible to calculate an estimate of service income and, in turn, calculate price sub-indices and associated weights for overdrafts, other loans and advances, interest bearing sight deposits and time deposits (a deposit where notice for withdrawal is required). The overdrafts and other loans and advances sub-indices have been aggregated to obtain a loans sub-index and the interest bearing sight deposits and time deposits sub-indices have been aggregated to obtain an interest bearing deposits sub-index. The loans and interest bearing deposits sub-indices have then been aggregated to obtain the banking CSPI. The structure of the banking CSPI is shown in Figure 1.

In the approach outlined in this article, the calculation of service income serves two purposes. The service income, adjusted to obtain service price, is used to derive the price sub-indices for the four products: overdrafts, other loans and advances, interest bearing sight deposits and time deposits. The base year's service income (i.e. year 2000) is also used in the calculation of gross sector turnover, for the purpose of fixing the weights at each level. The rebasing article (Barford and Fenton, 2004) in this series of three articles gives a definition of gross sector. The methodology and calculations involved in estimating a price index for banking, based on the available data, are detailed below.

### Service Income

For each product, the service income is the difference between the value of funds and the cost of funds, with an adjustment made for the number of days in the quarter. The value of funds is the sum of the income received or estimated as receivable at a reference rate, with cost of funds being

**Figure 1 Structure of the current banking CSPI**



interest paid or estimated as payable at a reference rate. The service income equations (and interim equations) for overdrafts and time deposits are provided in Equations 1 and 2 of Annex A, respectively, for illustration purposes.

Interest data have been gathered from the BoE's returns. Fees data for loans are currently estimated (following consultation with the BBA). The days adjustment applied in the service income calculation is the ratio of the number of days in a standard quarter (i.e. 91.25 days) to the number of days in the actual quarter (i.e. 90 days in quarter one, 91 days in quarter two, 92 days in quarter three and 92 days in quarter four). The days adjustment is applied to ensure that the same product is priced each quarter. The standard product used is the servicing of a loan/deposit for an average quarter of 91.25 days.

The repo rate is currently used as the reference rate. The repo rate (short for sale and repurchase agreement) is the rate at which the Bank of England deals with its counterparts in the money markets. The majority of repo agreements have a 14-day maturity. The repo rate, also known as the base rate, is set by the Monetary Policy Committee to meet the Government's stated inflation target.

**Price Indices**

Two further adjustments have been necessary, to convert service income to a measure of price. Firstly, because the data received relate to a sample of banks only, the service incomes need to be weighted up to estimates of population totals. Then to obtain a price for each loan or deposit, these estimated totals should be divided by the corresponding number of loans or deposits. Unfortunately the numbers of

loans and deposits are not available. It was therefore necessary to determine an appropriate proxy. In the absence of a more suitable proxy the joint working group has used the change in the quarterly count of the number of businesses outside SIC division 65 with annual turnover in excess of £1 million as a proxy for the change in the number of loans and deposits. It was necessary to apply the same proxy adjustment to all four products.

With the calculated service prices it was possible to calculate the price sub-indices for the four products: overdrafts, other loans and advances, interest bearing sight deposits and time deposits (as defined in Equation 3 of Annex A, where the price sub-index calculations for overdrafts are illustrated). These sub-indices were then aggregated to obtain a loans sub-index and an interest bearing deposits sub-index (as defined in Equation 4 of Annex A, where the price sub-index calculations for loans are illustrated). The product group indices were then aggregated to obtain a banking CSPI that aims to track the average price per loan and interest bearing deposit. (See Equation 5 in Annex A.)

At each aggregation level it was agreed that the weights should be fixed in the year 2000 (i.e. the current base year) and rebased every five years, to be consistent with existing CSPIs, and aligned with the usual ONS approach. To implement this, it was necessary to calculate the gross sector turnover in the year 2000 at product level, product group level and the banking level. Output information for banking is not available from the source used for most other existing CSPIs; therefore it was necessary to consider different methods. It was agreed that the 2000 gross sector turnover for each of the four products would be estimated by weighting up the service income (as defined in Equation 4 of Annex A) due to

the fact that the service income is only for a sample of banks. With the gross sector turnover for overdrafts and other loans and advances, the gross sector turnover for loans was found by summing the two quantities. Similarly, with the gross sector turnover for interest bearing sight deposits and time deposits, the gross sector turnover for interest bearing deposits was found by summing the two quantities. With a turnover value for each of the products and product groups, the associated weights were calculated as a ratio of the product's turnover to the product group's turnover.

With the gross sector turnover for loans and interest bearing deposits, the combined banking gross sector turnover was found. With this banking turnover, the weight of banking (loans and interest bearing deposits) in the current top-level CSPI is approximately 3.2 per cent on the net sector basis and approximately 2.9 per cent on the gross sector basis. The rebasing article (Barford and Fenton, 2004) in this series of three articles gives a definition of gross and net sector.

## Part 5 - Results

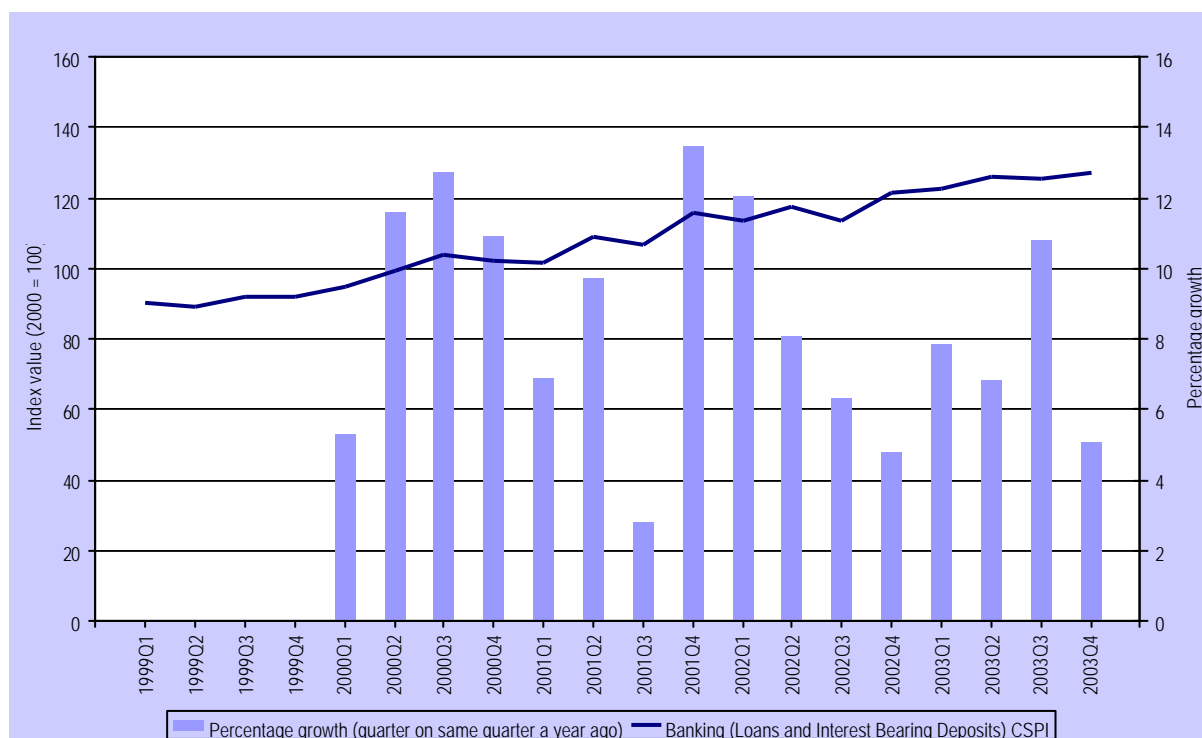
The results of applying the above methodology to obtain a banking CSPI are depicted in Figure 2. The banking CSPI is displayed along with percentage growth (i.e. quarter on same quarter a year ago).

As can be seen from the banking CSPI and the positive growth rates, there is a general upward movement. This has been largely due to increases in loan balances well in excess of increases in the proxy for numbers of loans (leading to higher income per service output). A large part of the rise in loan balances over the last few years has been concentrated in the real estate sector.

It is difficult to draw authoritative conclusions from such a short run of data, but as more data are collected (and if the index evolves through further development), a clearer indication of the movements within the banking CSPI should be able to be determined. Other possible factors determining movements in the index would be:

- (i) The existence of some fixed rate lending. This could lead to a fall in the index as repo rate increases, and vice versa.
- (ii) The reaching of a floor in deposit rates where it is no longer possible for banks to reduce rates as repo rate falls.
- (iii) Any timing differences between the changes in repo rate and the movement in interest rates charged/paid.

Figure 2 Banking CSPI with percentage growth



## **Part 6 – Issues Surrounding Current Approach**

The approach applied in the calculation of the banking CSPI represents an advance against the challenge of pricing banking services. In this approach, the calculation of service income and weighting patterns are approximated, recognising the underlying complexity of banking service pricing. Based on the available data, the developed banking CSPI is an appropriate, initial measure of the price for the considered subset of banking services.

A number of issues have been raised during the development of the banking CSPI. These are outlined below.

### ***Different Types of Banks/Pricing Policies***

Consultations about pricing policies were carried out by the BoE with a number of banks. These highlighted a number of differences between high street clearing (retail) banks, compared to investment banks. For example, investment banks tended to concentrate their business on large corporations; that is, typically those in the FTSE 100. Retail banks' lending volumes were mainly with medium sized corporations. Lending to large corporations is mainly referenced initially to LIBOR (London Inter-bank Offered Rate) and then is often a fixed rate thereafter. Lending for medium sized corporations tends to be priced as a margin over the repo rate, with a small proportion of fixed rate lending. The larger corporations are relatively small in number and have a variety of ways of raising debt, thereby are not presently the main drivers of bank lending to corporations. Lending volumes are mainly driven by the medium sized corporations, with small businesses, whilst large in number, borrowing relatively small amounts.

### ***The Fees Element***

It has been acknowledged that a potential weakness of the current approach is that the fees element is not separately identifiable for loan and deposit services (nor for the different types of loans) to businesses (i.e. private non-financial corporations). However, there is a new questionnaire to be used by the BoE that will collect such data from 2005 onwards. It will also include similar breakdowns for current account charges and for investment banking, advisory, brokerage and underwriting services, which, if required, should assist future development of the banking services CSPI beyond loans and interest bearing deposits.

As fees data are currently reported in total only, loan fees have been estimated as 15 per cent of the total fees reported, following consultation with the BBA, and deposit fees are zero. Also, as there is currently no fees split available between overdrafts and other loans and advances, a provisional 50:50 allocation has been used between the two products, with a view to improving the allocation once data are available from the new questionnaire returns.

There is a further issue with the fees element in that the data used for estimating the loan fees will not be available in time for each quarterly publication date. The BoE will therefore provide an approximation for each quarter's publication and, if necessary, it will be revised the following quarter. This is not regarded as a major problem at this time as the fees data are not volatile and have a small impact on the overall figures. To allow for this latency, at each publication the latest index value will have a provisional status.

### ***Products***

The joint working group agreed that breaking the product groups (loans and interest bearing deposits) down further into overdrafts, other loans and advances, interest bearing sight deposits and time deposits would supply more appropriate weightings and a more reliable banking CSPI. However, the decision was made to exclude non-interest bearing sight deposits (i.e. current accounts) at this time. This is because, as well as the account gaining no interest, there will usually be explicit service charges, either on a per debit/credit item basis or based on the account turnover. These service charges are important, but data for a representative sample of businesses are not currently available. Since there is some cross-subsidisation between fees charged and the average balances held in an account (and hence interest foregone), pricing this product on the basis of interest only could be misleading. The new BoE return will however collect data on service charges and so it may be possible to consider the introduction of non-interest bearing sight deposits in the future.

### ***Coverage***

The banking CSPI only covers loans and interest bearing deposits. It has been estimated that loans and deposits account for approximately 45 per cent of total banking activity. Service incomes for loans and interest bearing deposits are not an appropriate proxy for the other services that banks provide.

The sample of banks was selected on the basis of maximising coverage whilst minimising the number of banks (25 banks are currently sampled). The sample therefore represents the largest establishment of banks, and a reasonable national coverage has been ensured. The fact that the banks have not been selected in a random way introduces bias, but this is likely to be minimal due to the high sample coverages. The BoE are confident that the business of non-sampled banks is unlikely to differ considerably in price from that of the sampled banks.

The sample coverages (i.e. the percentage of loan/deposit volume covered by the sample of banks) for overdrafts, other loans and advances, interest bearing sight deposits and time deposits differ, but the coverage for each is high. For overdrafts, the sample coverage has stayed more or less the same, around 89 per cent, from 1999 Q1 to 2003 Q4. In the same period, the other loans and advances sample coverage has increased from approximately 62 to 74 per cent, the interest bearing sight deposits sample coverage has increased from approximately 83 to 89 per cent and the time deposits sample coverage has increased from approximately 70 to 74 per cent.

### ***Choice of Reference Rate***

Various different market rates, to act as reference rates in the service income calculations, were considered. These include the repo rate, one month and three month LIBOR (London Inter-bank Offered Rate) and swap rates. Evidence from discussions with banks, supported by statistical analysis of available data, suggested that the repo rate is the most widely used as a reference rate to determine pricing. Therefore, the repo rate has been used as the reference rate in the service income calculations.

Repo rate was outlined earlier. The LIBOR (London Inter-bank Offered Rate) is the rate on dollar-denominated deposits, also known as Eurodollars, traded between banks in London. The swap rate is a market rate for fixed rate funds for use in swap transactions, where a fixed rate interest flow on a notional principal sum can be bought or sold in exchange for a floating rate interest flow.

### ***Adjustments from Service Income to Service Price***

There has been much consideration of the need to adjust the service income (to obtain service price) to account for the changing number of loans and deposits and for the changing

sample coverage. As there is currently no way of determining the actual number of loans and deposits, the joint working group has used a quarterly count of UK businesses from the ONS IDBR, with an annual turnover in excess of £1 million and categorised outside the banking SIC 65 division, considering it to be the best available proxy for the number of loans and deposits. The turnover threshold of £1 million has been applied to avoid volatility arising from the number of small UK businesses. An adjustment for the changing sample coverage has also been applied.

### ***Weighting in the Top-Level CSPI***

In addition to the recent interest in considering the use of the banking CSPI as a deflator in the Index of Services (IoS), the development of a banking CSPI supports the overall aim of increasing the coverage of a top-level CSPI to represent price movements in the corporate services sector as a whole. This requires each index (such as banking) to have a weighting relevant to the base year (currently 2000). As mentioned previously, output information for banking is not available from the source used for most other existing CSPIs. Therefore, the working group have used the estimated service income for the year 2000, considering it to be the most appropriate, available representation of the banking (loans and interest bearing deposits) gross sector turnover for 2000. An appropriate, currently available method of estimating the net sector turnover is by applying a net to gross sector ratio calculated from relevant data obtained from the Financial Statistics section of the *National Statistics* website. For deposits, this ratio is total business deposits, excluding those belonging to the corporate service sector, divided by total business deposits. A similar calculation applies to the net to gross sector ratio for loans.

### **Conclusions**

The banking CSPI was first published in the February 2004 release of the experimental CSPI. It provides a FISIM-based price index for loans and interest bearing deposits and represents an advance in pricing banking services.

The index is still under development and should not be regarded as a proxy for all banking services. However, the development of the index provides a future basis on which the expansion in coverage of banking sector activities and the refinement of the applied statistical methodology may be achieved.

## Acknowledgements

ONS would like to thank the representatives from the BoE and the BBA for their involvement in the development of the banking CSPI.

## References

Barford N and Fenton T (2004) Rebasing and Other Developments to the Corporate Services Price Index.  
[www.statistics.gov.uk/cspi](http://www.statistics.gov.uk/cspi)

Financial Statistics,  
[www.statistics.gov.uk/StatBase/Product.asp?vlnk=376&Pos=2&ColRank=1&Rank=422](http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=376&Pos=2&ColRank=1&Rank=422), accessed September 2003

Hermiston K (2004) A Redeveloped Corporate Services Price Index for Business Telecommunications.  
[www.statistics.gov.uk/cspi](http://www.statistics.gov.uk/cspi)

## Annex A

### **Equation 1: Service Income for the Loan Products**

Note that service income is calculated separately for overdrafts and other loans and advances. The service income equation and the interim equations for overdrafts are illustrated, but the equations for other loans and advances have the same format and so have not been illustrated.

$$\text{Overdraft service income} = (\text{overdraft value of funds} \times \text{days adjustment}) - \text{overdraft cost of funds}$$

where

$$\text{Value of overdraft funds} = \text{overdraft interest} + \text{overdraft fees}$$

and

$$\text{Cost of overdraft funds} = \text{overdraft balance} \times \ln \left( 1 + \text{reference rate \%} \times \frac{\text{effective period}}{36500} \right) \times \left( \frac{91.25}{\text{effective period}} \right)$$

This formulation ensures the correct conversion from the repo rate payment basis.

### **Equation 2: Service Income for the Interest Bearing Deposit Products**

Note that service income is calculated separately for interest bearing sight deposits and time deposits. The service income equation and the interim equations for time deposits are illustrated, but the equations for interest bearing sight deposits have the same format and so have not been illustrated.

$$\text{Time deposit service income} = \text{value of time deposit funds} - (\text{cost of time deposit funds} \times \text{days adjustment})$$

where

$$\text{Value of time deposit funds} = \text{time deposit balance} \times \ln \left( 1 + \text{reference rate \%} \times \frac{\text{effective period}}{36500} \right) \times \left( \frac{91.25}{\text{effective period}} \right)$$

and

$$\text{Cost of time deposit funds} = \text{time deposit interest}$$

### **Equation 3: Price Sub-Index at the Product Level**

Note that the price sub-indices at the product level are calculated separately for overdrafts, other loans and advances, interest bearing sight deposits and time deposits. The price sub-index equation and the interim equation for overdrafts are illustrated, but the equations for other loans and advances, interest bearing sight deposits and time deposits have the same format and so have not been illustrated.

$$\text{Overdraft sub - index} = \frac{\text{overdraft service price in current quarter}}{\text{average overdraft service price in 2000}} \times 100$$

where

$$\text{Overdraft service price} = \text{overdraft service income} \times \frac{\text{average no. of companies in 2000}}{\text{no. of companies in current quarter}} \times \frac{\text{average overdraft coverage in 2000}}{\text{overdraft coverage in current quarter}}$$

#### **Equation 4: Price Sub-Index at the Product Group Level**

Note that the price sub-indices are calculated separately for loans and interest bearing deposits. The price sub-index equation and the interim equations for loans are illustrated, but the equations for interest bearing deposits have the same format and so have not been illustrated. Also note that overdrafts is illustrated in the interim equations, but the interim equations for other loans and advances, interest bearing sight deposits and time deposits have the same format and so have not been illustrated.

$$\text{Loans sub - index} = (\text{overdraft sub - index} \times \text{overdraft weight}) + (\text{other loans and advances sub - index} \times \text{other loans and advances weight})$$

where

$$\text{Overdraft weight} = \frac{\text{overdraft turnover}}{\text{overdraft turnover} + \text{other loans and advances turnover}}$$

and

$$\text{Overdraft turnover} = \frac{2000 \text{ Q1 overdraft service income} \times 100}{2000 \text{ Q1 overdraft coverage}} + \frac{2000 \text{ Q2 overdraft service income} \times 100}{2000 \text{ Q2 overdraft coverage}} + \frac{2000 \text{ Q3 overdraft service income} \times 100}{2000 \text{ Q3 overdraft coverage}} + \frac{2000 \text{ Q4 overdraft service income} \times 100}{2000 \text{ Q4 overdraft coverage}}$$

#### **Equation 5: Banking Index**

Note that the price index equation and the interim equations for banking are illustrated. The interim equations illustrate loans, but the interim equations for interest bearing deposits have the same format and so have not been illustrated.

$$\text{Banking index} = (\text{loan sub - index} \times \text{loan weight}) + (\text{interest bearing deposit sub - index} \times \text{interest bearing deposit weight})$$

where

$$\text{Loan weight} = \frac{\text{loan turnover}}{\text{loan turnover} + \text{interest bearing deposit turnover}}$$

and

$$\text{Loan turnover} = \text{overdraft turnover} + \text{other loans and advances turnover}$$