

Financial Services in the Consumer Price Index

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Abstract.

The construction of price indexes for financial services for inclusion in a consumer price index requires resolving complex conceptual and methodological issues. This paper presents a framework for defining the item domain of a CPI and proposals for constructing price indexes for a range of financial services suitable for inclusion in a CPI designed to measure price inflation for the household sector.

Keywords: *cost of living indexes, CPI, inflation, financial services*

Introduction

It is well recognised that the construction of price indexes for services is significantly more difficult than the construction of price indexes for goods. The production of price indexes for financial services has proven to be particularly problematic.

The purpose of this paper is to look at two key issues relevant to the inclusion of a broad range of financial services in a Consumer Price Index (CPI) namely; the item domain and price measurement. However, in order to do this properly, it is necessary to first establish the conceptual framework for the CPI.

Accordingly, the paper consists of three parts. Part I looks at the conceptual framework for the CPI (COLI or not COLI). Part II looks at defining the item domain for financial services to be included in a CPI designed to measure price inflation for the household sector. Part III looks at price measurement issues, in particular those encountered in constructing a measure for deposit and loan facilities.

The objective has been to develop a methodology that is as comparable as possible with the methodology used for most items in the CPI. Such an approach is seen as being easier to incorporate into an existing price index infrastructure (thus minimising possible procedural errors) and less difficult to explain to users and data providers (through drawing strong parallels between the treatment of financial services and the more traditional goods and services).

* The views expressed in this paper are those of the author and do not necessarily represent the Australian Bureau of Statistics (ABS) policy or the views of other ABS staff.

I. The conceptual framework for the CPI.

For me, the starting point of almost every index number problem is consideration of the principal purpose the index is intended to serve. Therefore, although not setting out to enter the debate about whether the Cost of Living (COL) index provides the best framework for a CPI or not (the COLI versus not COLI debate¹), I find it impossible to avoid the issue entirely.

It seems appropriate that I start by briefly confessing my own prejudices on the topic². Although it may appear as if I want to have a foot in both camps, I'd prefer to think in terms of seeking to reconcile both camps. My position is that I believe the consumer theory underpinning the COLI is of such value to index number practitioners that its applicability cannot be constrained to the single item domain argued as being appropriate for 'the' comprehensive COLI (or those CPIs that are unambiguously constructed by reference to a subset of the COLI domain).

Paraphrasing Triplett (1999), those elements of consumer theory of most value to index construction are the tenets of downward sloping demand curves and utility maximising behaviour. These alone provide the means of addressing a myriad of practical issues confronted in the day-to-day construction of indexes. For example, the most widely accepted approaches to the assessment of quality change in CPIs are based on utility theory – regardless of whether the index compiler explicitly accepts a COLI objective or not.

I can thus reconcile, in my own mind at least, the notion that one might like to construct a number of price indexes of relevance to households by reference to different, though largely overlapping, item domains (which may not be subsets of the comprehensive COLI). The item domain for each index would be determined by the principal objective or purpose of the index. However, they would share a common decision making framework for addressing the multitude of day-to-day index number problems. This framework being based on consumer theory or the COLI framework as we know it today. As the item domains of these indexes may not correspond to subsets of the item domain of the comprehensive COLI, these indexes may best be referred to as conditional COL indexes rather than subindexes of the COLI.

It is a relatively easy matter to map the conventional concepts of *outlays*, *acquisition*, and *use*³ to a purpose-based schema for determining relevant item domains. To do this, consider what might be regarded as three legitimate objectives or applications of price indexes constructed in respect of households. One, to assist in measuring changes in *living standards*; two, to evaluate changes in *money incomes* (I prefer this description to the more commonly used 'to escalate incomes' as it is more encompassing and less emotionally

¹ For an excellent summary of a complicated debate, see Triplett (1999).

² As this is not the principal subject of this paper, the exposition will be limited to only those issues essential to the task at hand.

³ See Turvey (1989) for explanations of these.

charged); and three, to measure *price inflation* for the household sector. Although CPIs are used for many more purposes, the relationship between these other applications and the price experiences of households is less clear – with perhaps other attributes of the CPI (such as regularity of publication, high profile, etc) outweighing any technical deficiencies.

Domain for an index used to measure changes in living standards.

This is the classic application for the COLI, so little needs saying. The starting point is acceptance that a household's standard of living is determined by those goods and services actually consumed⁴. These goods and services then form the item domain of the index. The required prices are the economic values of the goods and services consumed, which may not equate to the transaction prices paid by households (examples being goods or services provided to households free or at highly subsidised prices by government and the value of the housing services consumed by owner occupiers).

The value aggregate derived by summing the product of the quantities and prices in any one period equals the current value of aggregate household consumption. It therefore follows that a price index constructed in respect of the same domain would provide the best measure to deflate such values in order to compare consumption volumes over time. An increase (decrease) in per capita volumes representing an increase (decrease) in living standards.

Domain for an index used to assess changes in money incomes.

The domain here is defined as all those consumption goods and services purchased directly by households. To see why this is so consider a very stylized set of simple household accounts recording “source of funds” on the one hand and “use of funds” on the other. The use of funds account would record current expenditures (consumption goods and services, interest payments, local government rates and charges, etc) and investment (or savings). The source of funds would record income after tax (wages, transfers, property income insurance claims, etc) and savings. Noting that in this context savings represents a balancing item and, at the all households level, is generally expected to be positive (i.e. householders are net savers) so it would only appear as an entry in the use of funds account.

Accepting that savings represents forgone consumption, it can be seen that an index constructed in respect of this domain would provide the best measure to deflate household net money incomes in order to compare changes over time. The measure does not include any allowance for the notional payments of owner-occupiers to themselves as landlords as the notional income is not

⁴ This is of course a simplification as it ignores those things for which a positive amount serves to reduce the standard of living (such as pollution) and may require consumption of other goods and services in an attempt to mitigate (such as water purifiers). However important these may be, they are considered second order issues in this context as they are an issue for all index variants considered here.

recorded (not being “money income”, it is simply not relevant for this application)⁵.

The value aggregate for which this index is constructed equals expenditures made from net money incomes (and, with savings as the balancing item, net money income). If the intention is to use an index to adjust net money incomes to **just** achieve full compensation for price rises, then this index avoids the need to settle on something less than 100% escalation⁶. In fact, it can easily be demonstrated that the less than 100% escalation option typically does not deliver the correct outcome anyway⁷.

Domain for an index used to measure price inflation for the household sector.

Working from the view that inflation is a phenomenon peculiar to the operation of markets⁸, the domain is defined as all those goods and services acquired by households in monetary transactions⁹. However, this definition by itself is perhaps insufficient to fully guide the index compiler or to fully inform the index user. It is useful to supplement the definition by stating that the item domain can be turned around and viewed from the supply side. When this is done, it should be clear that the significance of items emanating from a single industry reflect that industry’s economic significance. In practice, this domain looks very similar to the first described above – the key differences being that it excludes notional transactions (e.g. the rents owner occupiers are deemed to pay themselves for housing services); and goods and services provided to households at subsidised prices are recorded using only those prices actually paid by households¹⁰ (e.g. public education and health services).

The value aggregate for this domain is clearly not constrained to equal either aggregate household consumption or aggregate household money income. So

⁵ A position long advocated by Turvey, see Turvey (1999).

⁶ See Triplett (1999) page 482.

⁷ Assume an owner-occupier household has a money income of \$70 and notional receipts from rent of \$30. If dwelling rents increase by 10% and all other prices remain unchanged, then an aggregate index including imputed rents would increase by 3% ($0.7 \times 0.0 + 0.3 \times 10$). Taking 70% of this increase (to reflect that proportion of total income that is subject to escalation) would deliver an increase of 2.1% when no increase is required.

⁸ See Woolford (1999).

⁹ While there would appear to be no compelling reason to restrict a price inflation domain to consumer goods and services, this restriction has been adopted here to simplify the comparison with the other domains. In practice a CPI designated as being an inflation measure may be constructed by reference to an item domain that includes at least some items regarded by economists as being capital in nature. For example, the Australian CPI includes the dwellings (excluding land) acquired by households for owner occupation.

¹⁰ Although in an ideal world it could be argued that all transactions that take place at non-market (or economically insignificant) prices should be excluded, this level of refinement is often not achievable in practice due to the need to ensure the CPI remains credible to the broad range of users.

this index could not be considered ideal for measuring either changes in living standards or changes in money incomes.

Differences in index outcomes.

The three item domains have more items in common than not, so it would be reasonable to expect the three indexes to deliver broadly comparable results more often than not. While this could lead to the conclusion that the precise construct adopted is of little relevance, it is nevertheless important that statistical agencies select a single concept for their CPI, if only to provide a consistent framework for the selection of items to be included and the basis on which they are to be priced. Which concept is selected depends on the principal use that is to be made of the index in each country.

However, it is instructive to look at a couple of examples of situations that would deliver different outcomes.

Consider the case of a subsidised commodity for which a change in government policy reduces the level of subsidy, all other things being equal. A *living standards* index would record no change, as there has been no change in the economic price (or value) of the commodity concerned. The money *income evaluation* measure would record a price increase reflecting the fact that households are now required to pay more out of their own pockets. The ideal *inflation* index would show no change, as the item would be excluded (but see footnote 10 concerning the compromises that are often made in practice).

Consider the case where the only prices to increase are those for dwelling rents. The *living standards* index would record a higher rate of increase than either of the other two, reflecting the fact that this index assigns a larger weight to dwelling rents to cover the value of the flow of housing services enjoyed by owner occupiers.

Finally, consider the case of so called ‘income dependent’ prices, that is prices that depend (at least to some extent) on the income of the purchasing household. Assume that the only change in actual transaction prices between two periods can be attributed to changes in household incomes¹¹. With no change in the economic value, the *living standards* index should show no change. The *income evaluation* index should record the increase. To the extent that this pricing mechanism is generally used to implement a subsidy programme, then an ideal *inflation* index would exclude the item and thus show no change.

These different outcomes would seem to accord perfectly with the uses to be made of the respective indexes.

¹¹ Reflecting an increase in the incomes of a constant base of households rather than an increase resulting from a change in the mix of households.

Are substitutions relevant for all index purposes?

Some, such as Hill (1997), have argued that because a COLI framework holds only utility levels constant (rather than quantities) it is inappropriate for an index intended to measure price inflation *because the requirement is for a measure of pure price change*. I am not convinced that this literal interpretation reflects what is required for any of the three purposes outlined above.

Surely an index concerned with assessing changes in money incomes, particularly with a view to providing some compensation for adverse price changes, would wish to abstract from those price effects that households are able to directly compensate for by adjusting their consumption patterns¹². Likewise, it would seem logical that users of an inflation index would also be more interested in a measure of what could be termed the effective rate of inflation (i.e. that rate of price change beyond that which households are able to compensate for), as it would only be this rate that would constitute a sensible policy target for price stability¹³.

While this is an important conceptual issue, there is a need to recognise that the contemporaneous construction of such an index is not a practical option at this time. Even if it was, the difference it would make to aggregate index outcomes is likely to be small. However, the construction of indexes that correctly account for this type of substitution should be an aspiration of statistical agencies and the conceptual desirability of making this sort of abstraction should influence decision making in the meantime.

II. The item domain for financial services.

The threshold issue is to determine precisely which financial services fall in scope of the CPI.

There are many services acquired by households that could potentially be regarded as financial services. Some common examples are: financial advice, currency exchange, services associated with deposit and loan facilities, services provided by fund managers and life insurance offices and superannuation funds, stockbroking services, real estate agency services, etc.

There are also a number of different ways of classifying or treating these services. For example they could be classified according to whether the acquisition of the service normally involves an ongoing relationship with the service provider (deposit and loan facilities, fund management, superannuation services, etc) or whether the service generally does not require such a

¹² I make this point only in respect of substitutions made in response to changes in relative prices. The issue of what to do about changes in consumption brought about by changes in environmental factors is something that requires further research and is out of scope of this paper (see earlier comments under living standard domain).

¹³ This is particularly obvious if you consider the long run implications. Among other things, holding quantities fixed denies technological advances such as the replacement of oil lamps with the electric light.

relationship (stockbroking services, currency exchange, real estate agency services, etc).

It can also be argued that at least some of these services are inextricably combined with some capital (or investment) activity and hence should themselves be capitalised or, at the very least be defined as out of scope of a consumer price index as not being ‘consumption’.

Some would also argue that the real estate agency services associated with the acquisition and disposal of owner occupied housing is more correctly classified as a housing service than as a financial service.

Each of these viewpoints has merit. Yet I am also uncomfortable with each of them, as they either remove from the scope of a CPI at least some things that the general populace would regard as belonging in a CPI (e.g. bank fees and charges) or they tend to draw distinctions that are somewhat arbitrary (e.g. the boundary between what is ‘consumption’ and what is not).

In seeking to resolve this and come up with a sufficiently robust definition for the domain suitable for an inflation index, I must admit to favouring as wide a definition of ‘consumption’ as possible (largely coinciding with current expenditure). In this paper I am concerned only with defining the domain for a price inflation CPI. Although I believe a strong case can be made for the use of an identical domain in a living standards index, I can also see strong arguments to the contrary – hinging essentially on the ‘consumption’ ‘not-consumption’ argument – and would not presume to try and resolve them here! While a money income domain should be less contentious, I also do not address it here.

Definition.

An appropriate definition would seem to be something along the lines of, all those services acquired by households in relation to the acquisition, holding and disposal of financial and real assets, including advisory services.

There are two key aspects of this definition: One, it distinguishes between the services facilitating the transfer and holding of the assets and the assets themselves and two, in determining whether the service is a financial service or not, no distinction is made between whether the asset in question is a real asset or a financial asset.

The second of these is probably the most contentious, particularly in relation to real estate agency services associated with the purchase and/or sale of residential property by owner-occupiers. The proposed approach stems from the view that despite the fact that the decision to purchase the principal dwelling is often motivated by factors other than investment, the consequence of the action of purchasing is that one asset (usually financial) is exchanged for another (a dwelling)¹⁴. In this respect, a dwelling to be used as a residence by a household would appear to be no different than a dwelling or other real estate

¹⁴ The counterparty to the acquisition of the dwelling asset is of course normally the creation of a financial liability rather than the rundown of an asset – but the principle is the same.

purchased solely as an investment. In turn, the outright purchase of a dwelling is little removed from investment in a dwelling via a property or similar trust.

If the alternative were to regard the services associated with the transfer of dwellings as a housing service, then the practical consequences would be as follows. First, the weight for property transfer services would be high relative to the value of the net acquisition of dwellings (particularly apparent if this happens to be included in the index as it is in Australia), because the transfer costs relate to all transfers, including intra household transfers, not only those associated with newly acquired dwellings. Second, the measure of price change would be constructed differently, incorporating a measure of changes in asset prices¹⁵.

Because the derivation of weights (or value aggregates) for financial services is closely related to the measurement of price change, this is left to the following section. However the yardstick has to be that the value aggregate must reflect the net value of the service provided to the household sector by the financial services sector and, as such, a comparison with (say) the value of oranges acquired by the household sector should reflect the relative significance of the two commodities.

III. Measuring prices for financial services.

From a price perspective, financial services can be thought of as falling into one of two camps. First, those where an explicit price may be charged for a ‘service’ for which it is possible to at least think about in quantity terms (e.g. the preparation of a financial plan) and second, those for which the quantum is more difficult to grasp (e.g. maintaining a current account with a bank) and the ‘price’ less explicit. It is those services falling in the second camp that are of most interest, as they do not appear well suited to traditional price index practices.

I proceed by looking at some specific examples, hopefully working from the more straightforward to the more complex in such a way as to build an increasingly complex methodology that can be seen to share common origins.

Currency exchange.

Suppose the service we wish to price is that of facilitating the exchange of domestic currency for that of another country (the acquisition of an asset – foreign currency). The ‘price’ for the service is usually quoted in terms of some percentage of the domestic currency value of the transaction. This ‘margin’ is rarely changed. The service provider relies on the nominal value of the transaction increasing over time to deliver increases in fee receipts. The price

¹⁵ The reasoning here is that if the purpose of the underlying transaction is deemed to be solely for the purpose of gaining access to the dwelling, then the costs in future periods would essentially be determined as the amount it would then cost to gain access to the identical dwelling as in the base period. This would require escalating the base period transaction value by movements in dwelling prices (asset prices).

required for index construction purposes is the monetary value of the margin (i.e. the amount determined by applying the percentage rate to the value of the currency transaction).

To measure price change over time, the index maker has to form a view about the quantity underpinning the original transaction (as the monetary value is not a quantum). There would appear to be two choices.

The first would take the view that the foreign currency was required to fund the purchase of some item of consumption from a foreign country (e.g. expenditure on foreign travel, direct importation of some commodity). Taking this view, the price in subsequent periods could be expressed as the amount that would be payable on the conversion of that sum of domestic currency required to purchase that amount of foreign currency required to purchase the same quantum of goods and services purchased in the base period. A practical translation implies the original foreign currency amount be indexed forward using changes in foreign prices, this revalued foreign currency amount would then be converted to domestic currency at the prevailing exchange rate, and finally, the prevailing margin is applied to this new amount to deliver the current price. This current price would be compared to the base price to derive the measure of price change.

The second option is to take the view that the resident household acquired the foreign currency as part of some investment strategy. Taking this view, the domestic currency value can be interpreted as savings (or forgone consumption). The underlying quantities, in concept, are therefore determined by reference to the resident households total annual consumption basket (being some proportion of this). The price in subsequent periods would be expressed as the amount that would be payable to convert, into foreign currency, that sum of domestic currency that would be required to purchase that same proportion of base year consumption at current period prices. That is, the original domestic currency amount would be indexed forward by changes in domestic prices and the prevailing margin would be applied to this new amount to deliver the current price.

In terms of index outcomes, the second option only reflects changes in domestic prices (or inflationary pressures) while the first is more likely to be driven by external factors (foreign rates of inflation and exchange rates). However, index outcomes should not determine which approach to adopt. In reality, currency exchanges will be undertaken for a mix of the two reasons outlined above. Statistical agencies could choose to employ both methods with the value aggregate for each reflecting the known or estimated significance of each, or they could choose that method which corresponds to the estimated most common requirement for foreign currency by resident households.

If a single margin (percentage rate) does not apply to all transactions (i.e. different rates apply to different size transactions), then the price measure would be constructed by reference to a representative sample of base period transactions. The current period margin for each transaction would be

determined by the aggregate current dollar value of each transaction. Such an approach would serve to also capture any price change resulting from the value of an underlying transaction moving from one price band to another.

Stockbroking services.

Consider the case of the purchase of a parcel of shares in a publicly listed company. In most countries, the purchase has to be arranged through a licensed broker (stockbroker). The total amount paid by the purchaser can comprise three elements – an amount for the shares (the asset), a fee for the brokerage service and some form of transaction tax (stamp duty).

The first issue of principle is to decide whether the tax should be considered an integral part of the price of the security (shares) or whether it more correctly forms part of the cost of acquiring the shares – choosing the first would see the tax excluded from the CPI, while choosing the second would see the tax being included along with the brokerage cost in the CPI. Compelling arguments could be mounted for either position. I advocate the second position as being more consistent with both the intention of the tax and the more commonly accepted basis for valuation of the shares¹⁶.

The second issue is to decide what best represents the quantum underlying the shares. Again there would seem to be two options. The first would be to view them as being some proportion of an enterprise of fixed size. The second would be to regard it as forgone consumption. Leaving aside the substantial practical difficulties involved with the first, the latter accords better with consumer theory and is thus preferred.

Working from the premise that stockbrokers' fees are more likely to follow a step function than a linear function, a price measure would be constructed as follows. Select a representative sample of transactions (dollar values) and calculate the tax payable and the fees payable by reference to respective schedules. The taxes and fees payable in subsequent periods are calculated by first indexing forward the values of the sample transactions and then applying current fee and tax schedules to the revalued transactions.

This methodology raises two issues. One, what is the most appropriate index for revaluing the transactions and, two, how to determine the current schedule of fees. Note that the current tax schedule is assumed to pose no problems, as it would be widely available.

The obvious choice for an escalator would be the CPI itself, though for practical reasons this would need to be lagged by one period. However, simply using a one period lagged CPI may result in outcomes that are not always plausible, as it will produce an echo effect. For example, all other things being unchanged, the current period movement in the price of stockbroking services will equal the previous period movement in the aggregate CPI. While this

¹⁶ It also proves convenient to adopt this principle here as it allows for comparable treatment of taxes on banking services later (for which the issue is perhaps less contentious).

would not appear to be at odds with the concept, credibility problems arise if the previous period CPI was influenced significantly by some one-off, temporary or unusual price change (e.g. an oil price shock, change to health care arrangements, etc). Most users of the index would have difficulty believing that such effects would flow through virtually instantaneously. To mitigate this effect while preserving the conceptual integrity of the measure, a better escalator would be to use a lagged 12-month moving average CPI. Briefly, the conceptual justification for this is that a 12-month moving average is consistent with the weighting base period, which represents a full years activity.

Competition in the stockbroking industry means there is unlikely to be a common fee schedule. If individual brokers adhere reasonably closely to an in-house fee schedule, obtaining copies of these schedules should be a relatively simple matter. On the other hand, if no such fee schedules exist, then a survey of stockbrokers may be required to collect information on a sample of trades (value of trade and fee charged) and this information used to derive a current period fee schedule.

What about the sale of shares? The underlying transaction represents the exchange of one asset for another (in this case shares for cash). There does not appear to be any compelling argument to suggest that the underlying quantities should be seen any differently from those underpinning a share purchase (i.e. some current period basket of consumption goods and services). In reality, households alter their investment strategies regularly in order to 'store' their forgone consumption in that particular asset class that they believe offers the greatest protection or prospect for growth. A symmetrical treatment of the purchase and sale of shares is particularly appealing. Unless different fees or taxes apply depending on whether the transaction represents a purchase or a sale, there is no need to distinguish between the two in constructing the index.

Deposit and loan facilities.

Accounting for the costs of services provided by financial intermediaries represents a significant step-up in complexity. The service being provided is difficult to comprehensively visualise and the prices comprise significant elements that are not directly observable. I start by considering what might be thought of as a traditional bank providing a single loan product and a single deposit product, then build to a typical bank as we know it today.

The traditional bank charged no direct fees; its income was derived by charging borrowers a higher rate of interest than it paid depositors. The twin problems we are faced with are valuing the services provided to borrowers and depositors and then deriving appropriate price measures.

OECD (1998), provides a good summary of the developments in the thinking of national accountants and explains the notion of a 'reference rate'. In concept, SNA 93 describes the reference rate as the risk free or pure interest rate. The value of the service provided to a borrower is the difference between the

amount of interest paid by the borrower and the (lesser) amount that would have been paid had the reference rate been used. The converse applies for depositors. In practice statisticians experience great difficulty in identifying an exogenous reference rate that does not also result in volatile and sometimes negative measures of these services (as would occur if the reference rate lies above the lending rate or below the deposit rate). As a practical expediency, the use of an average of borrowing and lending rates is now advocated (with the mid-point being favoured)¹⁷.

So, if the base period value of the financial service is given by applying a margin (the absolute difference between the reference rate and the rate of interest charged to borrowers or paid to depositors) to a balance (loan or deposit), how should the price measure be constructed? In line with the previous examples, the concept would be to index forward the amount of the base period balance and then apply comparison period margins to calculate a dollar value. The comparison period dollar value and the base period dollar value are then used as prices to compute the movement between the two periods.

Again, the issue of an appropriate escalator needs to be addressed. While the base period flows (amounts deposited and amounts withdrawn) can be readily expressed in terms of forgone consumption at base period prices, how should we treat balances (a stock) that are likely to reflect an accumulation of flows over a number of years? One option would be to construct an age profile of the balances and use this to construct a moving average of the CPI. While in some circumstances this might be the preferable way to go, in practice it would be virtually impossible to do! An alternative is to view base period balances as representing some quantum of consumption goods and services at base period prices – in which case the 12-month moving average CPI can be used¹⁸.

The traditional bank has all but disappeared and most financial institutions now derive income from a combination of indirect fees (margins) and direct fees and charges, with the trend being a move from margins towards direct fees. With this scenario, the challenge is to construct measures of price change that reflect the total price of the service and therefore capture any offsets between margins and direct fees. As with stockbroking services there may also be taxes levied on financial transactions and/or balances and these should also be included in the ‘price’.

¹⁷ I would be less apologetic about the use of a mid-point reference rate than is the case in OECD (1998). I am not convinced that the conceptual ideal is for some “risk free” interest rate, but rather the interest rate that might have been struck in the absence of financial intermediaries (i.e. the rate that would have been struck by depositors dealing directly with borrowers). Such a rate would have incorporated the lenders knowledge of risk. In any event, taking the mid-point of the borrowing and lending rates would appear to be a good means of estimating this market-clearing rate.

¹⁸ This is also equivalent to thinking of households reviewing their investment/consumption decisions on an annual basis, which is also probably not too far from reality.

Frost (2001), provides a description of the more practical aspects of constructing price indexes for deposit and loan facilities based on recent experiences at ABS, so these will not be covered here. What I will outline however, are the key principles and broad data requirements.

First, as is clear from the above, it is not sensible to construct broad measures of margins (or to use the national accountants parlance, Financial Intermediation Services Indirectly Measured, or FISIM) independently from the direct fees and taxes. What is required is a total price measure that recognises the various elements of the total price.

To abstract as far as possible from the effects of compositional change and to provide a mechanism for the measurement of the direct fee and taxes elements, the approach should be to construct price measures for specific (relatively homogeneous) products that can then be weighted together to provide a measure for deposit and loan facilities in aggregate¹⁹.

To cope with the step function style pricing and taxing practices²⁰ so commonly employed in the financial services industry, requires samples of customer accounts²¹ with all the necessary charging variables identified. These samples should cover a full years activity.

To minimise problems associated with non-response and changing industry structures, a separate reference rate should be constructed for each sampled service provider. The reference rate should be calculated in respect of all loans and deposits (including those to businesses). Further, to avoid problems that may arise in the timing of accounting entries (e.g. revisions, interest income on credit cards etc), monthly yields, reference rates and margins should be constructed by reference to 3 month moving averages of the reported underlying balances and interest flows.

The basic process is then to first select a sample of representative products from each sampled institution. Second, select a sample of customers for each product. Third, to estimate the total base period value of the service associated with each product by element (margin, direct fees and taxes) – these value aggregates can be viewed as being equivalent to prices for some quantum. Then the comparison period prices are derived by moving forward the base period value aggregates as follows:

- Margin. Index forward the base period balance and apply comparison period margin (difference between comparison period reference rate and

¹⁹ This represents an identical strategy to that adopted throughout the CPI. For example, the index for motor vehicles is constructed by pricing a sample of individual vehicles and weighting these price measures to derive an aggregate, instead of (for example) attempting to directly construct an index for the supplier or producer of a range of vehicles.

²⁰ For example, fees that are only payable after some number of transactions or if balances fall below some level etc.

²¹ If it is not possible to sample actual accounts, then a set of accounts representative of different customer profiles could be built up by the index compilers.

product yield). In practice, the ‘price’ movement is given as the product of the indexation factor and the ratio of margins.

- Fees. Index forward transaction values for each sampled account (or profile) and apply the comparison period fee structure. Ratio of new aggregate fees to base fees²² used to move Fee value aggregate.
- Taxes. As for fees only use tax schedules instead of fee schedules.

It is important to note that it will generally not be possible to sum the margin value aggregates (or the fee value aggregates) across products to arrive at a total estimate for margins, due to the linking that will often be required to account for completely new fees or taxes for which the existing sample account data is deficient²³.

Appendix 1 contains a worked example of the calculation of a price index for a single deposit product.

Conclusions

The recent trend towards more explicit fees and charges by banks and other financial institutions has perhaps been the single greatest cause for the general community to question why these prices are not included in consumer price indexes. Statisticians and economists have long recognised the increasing significance of financial services to households and the growth of service industries in the economy generally and have been extremely conscious of the gap in official statistics.

However, the complex conceptual and methodological issues that constructing these measures presented have impeded progress. While this paper presents a framework for determining which financial services fall within scope of the CPI and presents a consistent methodology for constructing measures of price change for at least some of those services, much still needs to be done. The financial services industry is highly innovative and the nature of the services and the way in which they are provided are constantly changing. This paper does not address indexes for life insurance and superannuation products or the issue of identifying and measuring quality change for these services – and doing so will probably increase the complexity of the measures by an order of magnitude.

Despite the obvious shortcoming of the proposed measures, the measurement of quality change is seen as a second order issue that should not preclude making a first step. The reasonable expectation is that even non quality-adjusted price indexes for these services should show a lesser rate of price

²² The aggregate fees in the base and comparison periods can be constructed as either arithmetic or geometric averages of the fees calculated for the individual customers.

²³ This is a complex technical issue that is beyond the scope of this paper as the objective here has been to present a somewhat stylised version.

growth over the medium to long term than the average recorded for all other items currently included in the CPI.

Appendix 1: Example calculation of a price index for a deposit product.

Table 1: Base period sample account²⁴

<i>Date</i>	<i>Dr/Cr</i>	<i>Transaction</i>	<i>Transaction value</i>	<i>Tax</i>	<i>Balance</i>
				\$	
					456.23
2-Jan	Dr	Over the counter withdrawal	107.05	0.70	348.48
12-Jan	Cr	Deposit	4000.00	2.40	4346.08
13-Jan	Dr	EFTPOS transaction	50.62	0.30	4295.16
13-Jan	Dr	Over the counter withdrawal	371.00	0.70	3923.46
14-Jan	Dr	Own ATM cash	300.00	0.70	3622.76
14-Jan	Dr	Own ATM cash	100.00	0.70	3522.06
16-Jan	Dr	Own ATM cash	100.00	0.70	3421.36
16-Jan	Dr	Over the counter withdrawal	371.00	0.70	3049.66
16-Jan	Dr	Cheque	90.00	0.30	2959.36
19-Jan	Dr	Own ATM cash	100.00	0.70	2858.66
19-Jan	Dr	Own ATM cash	100.00	0.70	2757.96
19-Jan	Cr	Deposit	4000.00	2.40	6755.56
19-Jan	Dr	Cheque	740.00	1.50	6014.06
20-Jan	Dr	EFTPOS transaction	76.42	0.30	5937.34
21-Jan	Dr	Other ATM cash	20.00	0.30	5917.04
21-Jan	Dr	Cheque	100.00	0.70	5816.34
22-Jan	Dr	Cheque	43.40	0.30	5772.64
22-Jan	Dr	Cheque	302.00	0.70	5469.94
22-Jan	Dr	Cheque	37.00	0.30	5432.64
23-Jan	Dr	Over the counter withdrawal	371.00	0.70	5060.94
23-Jan	Dr	Cheque	72.00	0.30	4988.64
27-Jan	Dr	Own ATM cash	150.00	0.70	4837.94
27-Jan	Dr	Cheque	73.50	0.30	4764.14
27-Jan	Dr	Cheque	260.00	0.70	4503.44
27-Jan	Dr	EFTPOS transaction	51.45	0.30	4451.69
28-Jan	Dr	Over the counter withdrawal	19.95	0.30	4431.44
28-Jan	Dr	Cheque	150.00	0.70	4280.74
29-Jan	Dr	Cheque	140.00	0.70	4140.04
30-Jan	Dr	Over the counter withdrawal	371.00	0.70	3768.34
30-Jan	Dr	Cheque	8.00	0.30	3760.04
30-Jan	Dr	Cheque	60.00	0.30	3699.74
Total Taxes:				21.10	
Fees					
	<i>Activity</i>	<i>Total number</i>	<i>Number charged</i>		<i>Amount</i>
				\$	
	Over the counter withdrawal	6	2		6.00
	EFTPOS transaction	3	0		0.00
	Own ATM cash	6	0		0.00
	Other ATM cash	1	1		1.20
	Cheque	13	3		3.00
	Deposit	2	2		0.00
Total Fees:					10.20

²⁴ Only a single month's data is used in this example. In practice, many accounts would be sampled with each account containing data for a full year.

Table 2: Fee schedule²⁵

<i>Description</i>	<i>Base period</i>		<i>Current period</i>	
	<i>No. free</i>	<i>Charge</i>	<i>No. free</i>	<i>Charge</i>
Over the counter withdrawal	4	\$3.00	4	\$3.00
EFTPOS transaction	10	\$0.50	9	\$0.50
Own ATM cash	10	\$0.50	9	\$0.50
Other ATM cash	0	\$1.20	0	\$1.20
Cheque	10	\$1.00	9	\$1.00
Deposit	0	\$0.00	0	\$0.00

Table 3: Tax schedule²⁶**Bank Accounts Debit Tax (BAD)**

<i>Trans value</i>		<i>Tax</i>	
<i>Min</i>	<i>Max</i>	<i>Base</i>	<i>Current</i>
0	1	\$0.00	\$0.00
1	100	\$0.30	\$0.30
100	500	\$0.70	\$0.70
500	5000	\$1.50	\$1.50
5000	10000	\$3.00	\$3.00
10000	+'	\$4.00	\$4.00

Financial Institutions Duty (FID)

<i>Base</i>	<i>Current</i>
0.06%	0.06%

Table 4: Interest data²⁷

	<i>Base period</i>				<i>Current period</i>			
	<i>Balance</i>	<i>Interest</i>	<i>Int rate</i>	<i>Margin</i>	<i>Balance</i>	<i>Interest</i>	<i>Int rate</i>	<i>Margin</i>
	<i>\$ mill</i>		<i>%</i>		<i>\$ mill</i>		<i>%</i>	
Deposit products								
Personal	22000	740	3.3636	2.4937	23600	775	3.2839	2.3971
Current accounts	6000	68	1.1333	4.7241	6600	75	1.1364	4.5446
Other accounts	16000	672	4.2000	1.6574	17000	700	4.1176	1.5634
Business accounts	25000	920	3.6800	2.1774	28000	1000	3.5714	2.1096
Total deposit accounts	47000	1660	3.5319	2.3255	51600	1775	3.4399	2.2411
Loan products								
Personal	42000	3188	7.5905	1.7331	46000	3400	7.3913	1.7103
Business	28000	2540	9.0714	3.2140	31000	2700	8.7097	3.0287
Total loan accounts	70000	5728	8.1829	2.3255	77000	6100	7.9221	2.2411
Reference rate			5.8574				5.6810	

²⁵ Summary of the information typically available from financial institutions. For each period, the table includes the number of free transactions and the per transaction charge for additional transactions.

²⁶ Table of tax rates of the type employed in Australia. The debits tax (BAD) is levied on all debit transactions to eligible accounts, with the amount charged being set for ranges of transaction values (i.e. using a step function). Financial institutions duty (FID) is levied on all deposits with the amount being determined as a percentage of the amount of the deposit.

²⁷ Table presents, in very summary form, balances and annualised interest flows derived by taking moving averages of data reported by financial institutions. Interest rates and margins are calculated from the balances and flows.

Table 5: CPI data²⁸

	<i>t-5</i>	<i>t-4</i>	<i>t-3</i>	<i>t-2</i>	<i>t-1</i>
All groups	117.5	121.2	123.4	127.6	129.1
4 term moving average				122.4	125.3
Indexation factor (movement)					1.0237

²⁸ Data required to derive the indexation factor. This example follows the Australian practice of a quarterly CPI. If a monthly CPI was produced, 12 term moving averages would be required rather than 4.

Table 6: Projected current period sample account²⁹

<i>Date</i>	<i>Dr/Cr</i>	<i>Transaction</i>	<i>Transaction value</i>	<i>Tax</i>	<i>Balance</i>
				\$	467.04
2-Jan	Dr	Over the counter withdrawal	109.59	0.70	356.75
12-Jan	Cr	Deposit	4094.75	2.46	4449.05
13-Jan	Dr	EFTPOS transaction	51.82	0.30	4396.93
13-Jan	Dr	Over the counter withdrawal	379.79	0.70	4016.44
14-Jan	Dr	Own ATM cash	307.11	0.70	3708.63
14-Jan	Dr	Own ATM cash	102.37	0.70	3605.56
16-Jan	Dr	Own ATM cash	102.37	0.70	3502.50
16-Jan	Dr	Over the counter withdrawal	379.79	0.70	3122.01
16-Jan	Dr	Cheque	92.13	0.30	3029.57
19-Jan	Dr	Own ATM cash	102.37	0.70	2926.51
19-Jan	Dr	Own ATM cash	102.37	0.70	2823.44
19-Jan	Cr	Deposit	4094.75	2.46	6915.73
19-Jan	Dr	Cheque	757.53	1.50	6156.70
20-Jan	Dr	EFTPOS transaction	78.23	0.30	6078.17
21-Jan	Dr	Other ATM cash	20.47	0.30	6057.40
21-Jan	Dr	Cheque	102.37	0.70	5954.33
22-Jan	Dr	Cheque	44.43	0.30	5909.60
22-Jan	Dr	Cheque	309.15	0.70	5599.75
22-Jan	Dr	Cheque	37.88	0.30	5561.57
23-Jan	Dr	Over the counter withdrawal	379.79	0.70	5181.08
23-Jan	Dr	Cheque	73.71	0.30	5107.08
27-Jan	Dr	Own ATM cash	153.55	0.70	4952.83
27-Jan	Dr	Cheque	75.24	0.30	4877.28
27-Jan	Dr	Cheque	266.16	0.70	4610.43
27-Jan	Dr	EFTPOS transaction	52.67	0.30	4557.46
28-Jan	Dr	Over the counter withdrawal	20.42	0.30	4536.73
28-Jan	Dr	Cheque	153.55	0.70	4382.48
29-Jan	Dr	Cheque	143.32	0.70	4238.46
30-Jan	Dr	Over the counter withdrawal	379.79	0.70	3857.98
30-Jan	Dr	Cheque	8.19	0.30	3849.49
30-Jan	Dr	Cheque	61.42	0.30	3787.77
Total taxes:				21.21	
Fees					
	<i>Activity</i>		<i>Total number</i>	<i>Number charged</i>	<i>Amount</i>
					\$
	Over the counter withdrawal		6	2	6.00
	EFTPOS transaction		3	0	0.00
	Own ATM cash		6	0	0.00
	Other ATM cash		1	1	1.20
	Cheque		13	4	4.00
	Deposit		2	2	0.00
Total Fees:					11.20

²⁹ The opening balance and transaction values are derived by applying the indexation factor to the base period amounts. The tax payable is determined by reference to the data in table 3. Fees payable are determined by reference to data in table 2.

Table 7: Indexes for current accounts³⁰

<i>Component</i>	<i>Base period</i>		<i>Current period</i>	
	<i>Value</i>	<i>Index</i>	<i>Value</i>	<i>Index</i>
	<i>aggregate</i>		<i>aggregate</i>	
Margins	28344	100.0	27913	98.5
Fees	11904	100.0	13071	109.8
Taxes	14739	100.0	14818	100.5
Total	54987	100.0	55803	101.5

³⁰ This table brings it all together. The current period value aggregates are derived as follows. For Margins – the base period aggregate is multiplied by the product of the indexation factor (Table 5) and the ratio of the current and base period margins for current accounts (Table 4). For Fees – the base period aggregate is multiplied by the ratio of total fees payable on the sample account in the current period (Table 6) and the base period (Table 1). For Taxes – the same procedure is followed as for fees.

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