

Financial Intermediation Services Indirectly Measured (FISIM) in the CPI

Barosevic, Marko

*Australian Bureau of Statistics, Consumer Price Index Section
Locked Bag 10*

Belconnen, ACT, 2617. Australia

E-mail: marko.barosevic@abs.gov.au

Conn, Lewis

*Australian Bureau of Statistics, Consumer Price Index Section
Locked Bag 10*

Belconnen, ACT, 2617. Australia

E-mail: lewis.conn@abs.gov.au

Cullen, Derick

*Australian Bureau of Statistics, Macroeconomics Research Section
Locked Bag 10*

Belconnen, ACT, 2617. Australia

E-mail: d.cullen@abs.gov.au

Abstract

The Australian Bureau of Statistics (ABS) has included estimates of financial intermediation services indirectly measured (FISIM) in the Consumer Price Index (CPI), National Accounts and Balance of Payments statistics in accordance with the relevant international standards. The CPI and national accounts estimates displayed some volatility during the period of the global financial crisis and attracted criticisms from the user community. Other countries had similar experiences with national accounts. Following extensive consultation and research work on the issue as part of the 16th Series Review of the CPI, the ABS has announced the exclusion of the FISIM component from the headline measure of the CPI until data and methodological improvements can be made. This paper details the research work undertaken that led to the ABS decision, examines some of the conceptual, methodological and data issues being researched by the ABS and by international task forces, and provides some suggestions for the way forward.

Keywords: Financial intermediation; Financial services; Indirectly measured; CPI

1. Introduction

Financial service institutions provide a variety of services to businesses, government and households such as ready access to funds, interest paying deposits and credit in the form of loans. As payment for these services, institutions generally charge users in two ways, direct fees and indirect fees in the form of margins on interest rates. The difference between the rate paid to banks by borrowers and the reference rate plus the difference between the reference rate and the rate actually paid to depositors represent charges for financial intermediation services indirectly measured (FISIM), [2008SNA 6.163].

Australia has included FISIM in its economic accounts since 1998 and the price of FISIM in the headline Consumer Price Index (CPI) from 2005 to 2011. Recently, the Australian Bureau of Statistics (ABS) has

undertaken a review of the measurement of the FISIM price, which has confirmed the concept, but identified areas for improvement in both data sources and methodology (ABS, 2010).

This paper outlines the current measurement of FISIM by the ABS, the impact of the Global Financial Crises (GFC), recent developments in the methodology and future work.

2. Implementation of FISIM in the ABS

The ABS implemented the concept of FISIM in the Australian System of National Accounts (ASNA) in 1998, with some minor modifications to scope and reference rates as set out in the 1993 System of National Accounts (1993SNA). The scope differences anticipated the changes made to FISIM in the 2008 System of National Accounts (2008SNA). The FISIM concept was implemented also in the Balance of Payments (BoP) to retain coherence with the National Accounts. The Australian National Accounts measure of FISIM focuses on measuring the volume of transactions directly from reported data.

An experimental price series for financial services was constructed by the ABS from 1998 to 2003 with extensive collaboration with the financial sector and key users. The price measure of FISIM was included as the indirect fee component charged on deposit and loan facilities (ABS, 2004). The International Consumer Price Index Manual Theory and Practice (ILO Manual, 2004 pp 14.59 – 14.62) recommended the inclusion of FISIM in both the reference aggregate #1 (for CPIs compiled on an outlays basis) and reference aggregate #2 (for CPIs compiled on an acquisitions basis). As part of measuring goods and services purchased by households, the ABS included both the weight and price movement of direct banking fees and indirect fees (FISIM) for household consumption in the headline CPI from June quarter 2005 to June quarter 2011, consistent with a CPI compiled on an acquisitions basis.

To measure the price of FISIM in the CPI, a sample of individual products was selected and the margin on each product was calculated. A key issue was how to calculate the amounts paid as interest margins on any single product (or account provided by a financial institution) as prices can be affected by both changes in yield and the reference rate. The 1993SNA recommended [6.125 and Annex III] that the value of services provided by means of interest rate margins be valued using a reference rate. In concept, the 1993SNA described this reference rate as being a risk free or pure interest rate. The 2008SNA clarified the reference rate to be a ‘service free rate’. This approach has the effect of valuing the service provided to a borrower as 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. Therefore, the price of the service per dollar borrowed is given by the difference between the interest rate paid by the borrower and the reference rate. For a depositor, it is the difference between the reference rate and the interest rate received by the depositor.

For the CPI, the ABS adopted the practical expediency of setting the reference rate at the mid-point of the borrowing and lending rates. This mid-point can be regarded as a proxy to a market clearing rate (i.e. the rate that would have been struck in the absence of financial intermediaries by depositors dealing directly with borrowers).

The method of estimation of FISIM in the CPI is summarised below;

- Monthly balance and interest flow data are obtained from selected financial institutions for each of their consumer products and in aggregate.
- A separate reference rate of interest is calculated for each institution as the mid-point of weighted average borrowing and lending rates.
- For each institution, a sample of products is selected to represent each of the major product

categories. The specific product selected from each group (e.g. the sampled home loan product) is assigned a weight to represent the entire product group (e.g. housing loans).

- The interest rate margin for each sampled product is calculated from the difference between the product yield and the reference rate. For deposit accounts the interest margin is the reference rate less the product yield, and for loan accounts it is the product yield less the reference rate.
- As percentages (such as margin rates) are not prices, the latest period margin rates have to be applied to some monetary amount in order to compute the current period prices (the dollar value of the margins). Balances on a series of sampled accounts are used for this purpose. To preserve the quantities underpinning the values of the account balances in the base period, the balances used to derive the dollar values of the margins are updated each period using a four-quarter moving average of the all groups CPI.

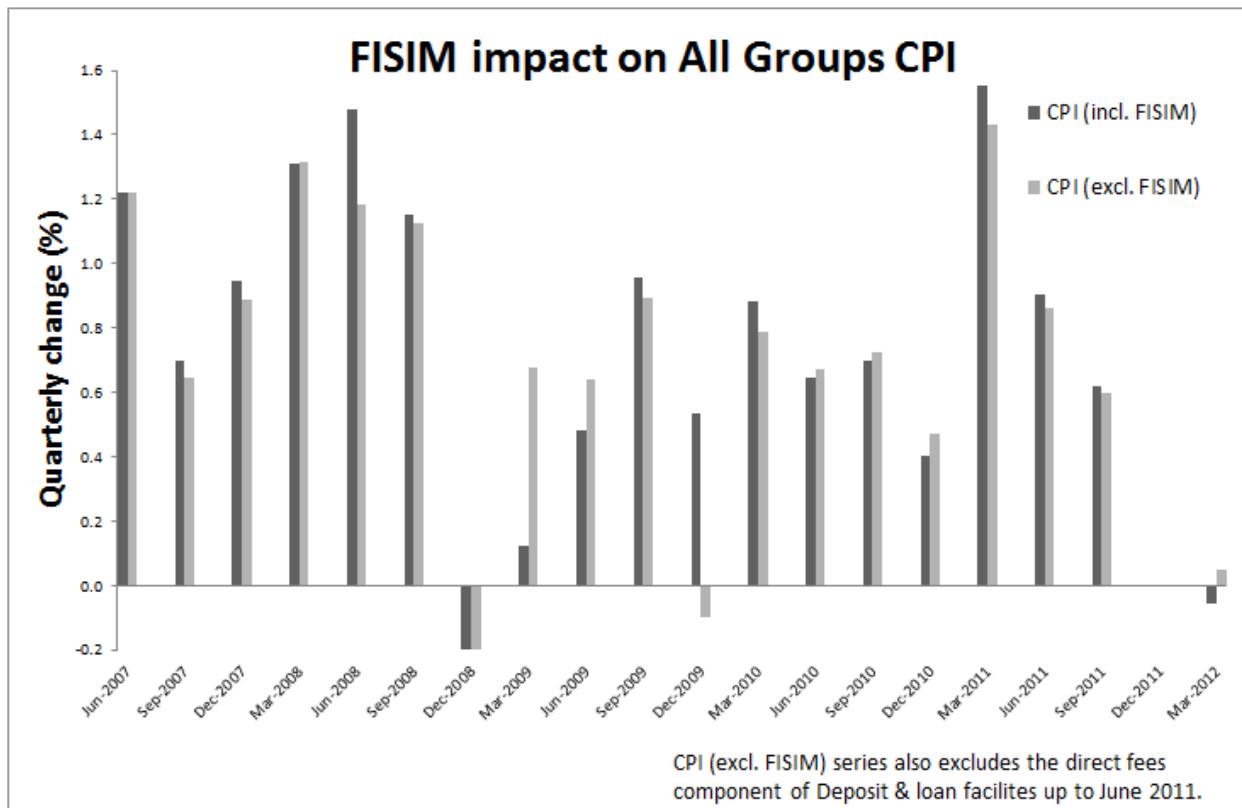
The FISIM price component of the deposit and loan facilities index is calculated by weighting the indexes for the sampled products according to the weight of the product group. To minimise the effect of any short-term accounting anomalies, the ABS constructs three-month moving averages of the average balances and interest flows and derives the required interest rates, reference rates and margin rates from the smoothed data.

3. Impact of the Global Financial Crisis on the measurement of FISIM in the CPI

Up until late 2008, while the measurement of FISIM in the ASNA, BoP and Prices achieved conceptual consistency, the data sources used to compile the estimates in each dataset were very different. The FISIM series in the ASNA and BoP had been relatively well behaved through a long period of steady growth in Australia but became difficult to interpret from late 2008. Reviews of FISIM in the ASNA and BoP identified better data sources and processes and some revisions resulted. However, the methods employed were confirmed.

At the same time, the FISIM price series in the CPI showed significant volatility and unpredictability. The use of the mid-point reference rate limited some of this volatility compared to the use of an exogenous rate such as the Bank Bill Swap Rate (BBSW). However, the stable relationship between loan and deposit account yields changed as financial institutions paid a premium for local deposit dollars, and floating rate products responded to sudden changes in policy rates, resulting in sudden movements in the reference rate. For products whose yields were close to the reference rate (eg. Fixed rate home loans and Term deposits) this drove large price movements and even negative prices in some cases. Figure 1 below shows the percentage change from previous quarter of the Australian All groups CPI and the All groups CPI *excluding* Deposit and Loan facilities. Deposit and loan facilities include both direct fees and indirect fees (FISIM), with neither published separately. Before June quarter 2008 the measurement of deposit and loan facilities did not have a marked effect on the headline CPI. Between June quarter 2008 and June quarter 2009 Deposit and loan facilities had a significant effect and led to criticism of the measurement of FISIM in the CPI.

Figure 1: The impact of Deposit and Loan facilities (FISIM) on All Groups CPI



A major periodic review of the CPI highlighted that many users were not satisfied with the behavior of the Deposit and Loan facilities index and its impact on the headline CPI (ABS, 2010). A significant portion of the research effort in the review was devoted to investigating issues related to the FISIM component of the price measure. Many of the findings are relevant to the measurement of FISIM and its decomposition into prices and volumes for both national accounts and balance of payments. Following the FISIM review, a number of improvements to data sources and processes were implemented in the CPI measure:

- Agreement with providers for comprehensive, detailed and timely data.
- Improved data allowed the average balances and interest flows of products to be reviewed and disaggregated into lower level products specifications where required. For example deposit products need to be accurately split out into term deposits, at-call savings and current transaction accounts.
- Annual reweighting of the dollar margins on products, and updated sampling of products.
- Mitigating the occurrence of negative prices.
- Increasing the interpretability of FISIM outputs by making methodological processes more transparent and explaining the results through real world phenomena.

While the ABS believes conceptually FISIM should be included in the headline CPI, there were key concerns which led to a decision to remove it. These concerns included the predictability, interpretability, data quality and lack of consensus internationally in measuring FISIM. This led to a decision that from the September quarter 2011, the indirect fees (FISIM) component of deposit and loan facilities would be moved to an analytical series; while the international methodology (including measurement of a reference rate), coherence with national accounts data and data sources are improved. A CPI including the FISIM series continues to be published as an analytical measure and the ABS aims to re-introduce it into the headline CPI at the next major update.

4. International Developments in measuring FISIM

The Australian experience with measuring FISIM during the GFC was not unique. Many countries suffered similar difficulties with FISIM estimates in national accounting which up to that point had been stable. There have been considerable research efforts by statistical agencies, academics and international organisations into these difficulties, for example Schreyer (2009) and Diewert, Fixler and Zieschang (2011) noted that the measurement of banking sector outputs and inputs raises many significant methodological problems. As well as stability and predictability, different assumptions on reference rates lead to a lack of comparability between economies (Diewert, Fixler and Zieschang 2011).

In late 2010 the Intersecretariat Working Group on National Accounts (ISWGNA) formed a task force charged with clarifying and investigating the measurement of FISIM. Although the work of this task force has not been completed, progress has been made on the conceptual and methodological issues related to FISIM in international trade, treatment of risk management (including liquidity transformation), separation of price from volume measures, and choice of a reference rate. Since FISIM in international trade is not relevant to the CPI, it is not considered here. The following is a preliminary report on the progress (see the interim report to United Nations Statistical Commission)

Treatment of risk management

The central question in measuring FISIM is the nature of production of services by financial intermediaries, specifically the activities they undertake to manage risk. There are two broad types of risk faced by financial intermediaries: the risk that a borrower will default, i.e. default risk, which includes both expected and unexpected defaults; and the risk that a financial institution may face due to differences in maturity terms of assets and liabilities in liquidity transformation. The latter is called term risk. Managing default and term risk are core activities of financial intermediaries, and these activities are not usually compensated by direct charges (fees) to users of the financial services produced, but rather in the interest rates charged.

The FISIM task force considered credit default risk and the methods employed by financial intermediaries to manage the risk. Essentially financial intermediaries charge interest to cover not only the production of loan services, but also to cover the expected default losses from the loan portfolio. In effect the defaulting loans are covered by the non-defaulting loans, which are regarded as a transfer from non-defaulters to defaulters, not production by the financial intermediary. The task force broadly agreed that credit default risk should be excluded from FISIM.

There are two methodological steps to be taken by statisticians to exclude default risk from FISIM estimates. The first is to use effective, not contractual or advertised, interest rates in the calculation of flows and selection of the reference rate. This requires real data on interest payments and receipts. The second is to adjust for expected loan write-offs that are covered by interest payments. How to do this adjustment will involve some research as the banking datasets differ from country to country.

Most financial intermediaries hold a mixture of fixed and floating rate deposit and loan products, and so the interest flows will adjust imperfectly to market conditions, and may adjust differently for deposits compared with loans. Managing this term risk is central to managing a financial intermediary.

The task force reached a broad consensus that term risk management is a financial intermediation service and in concept should be included in FISIM. To include term premiums in FISIM, the task force tentatively endorsed a broad basket of maturities approach to obtain a weighted average benchmark. This approach supports a single reference rate for FISIM calculations. Other methods to deal with differential interest rates

involve the use of different reference rates for different products.

Separating out the Price and Volume effects

The ISWGNA task force considered two approaches to decomposing FISIM estimates into price and volume effects. Practitioners generally favour independent measures of physical volumes as a first approach, for example numbers of transactions or numbers of accounts, which conform with other deflation activities in the national accounts. While there have been experiments in some countries, success has been restricted to retail products that tend to be more homogeneous than business products. Therefore, the deflated balances method suggested by the 2008SNA is likely to be the default method.

Choice of reference rates

The appropriate choice of a reference rate is one of the most significant methodological considerations in the measurement of FISIM. The appropriate choice of a reference rate is a particularly challenging endeavor in times of financial sector volatility where policy rates and market rates move suddenly such as the GFC of 2008 and 2009.

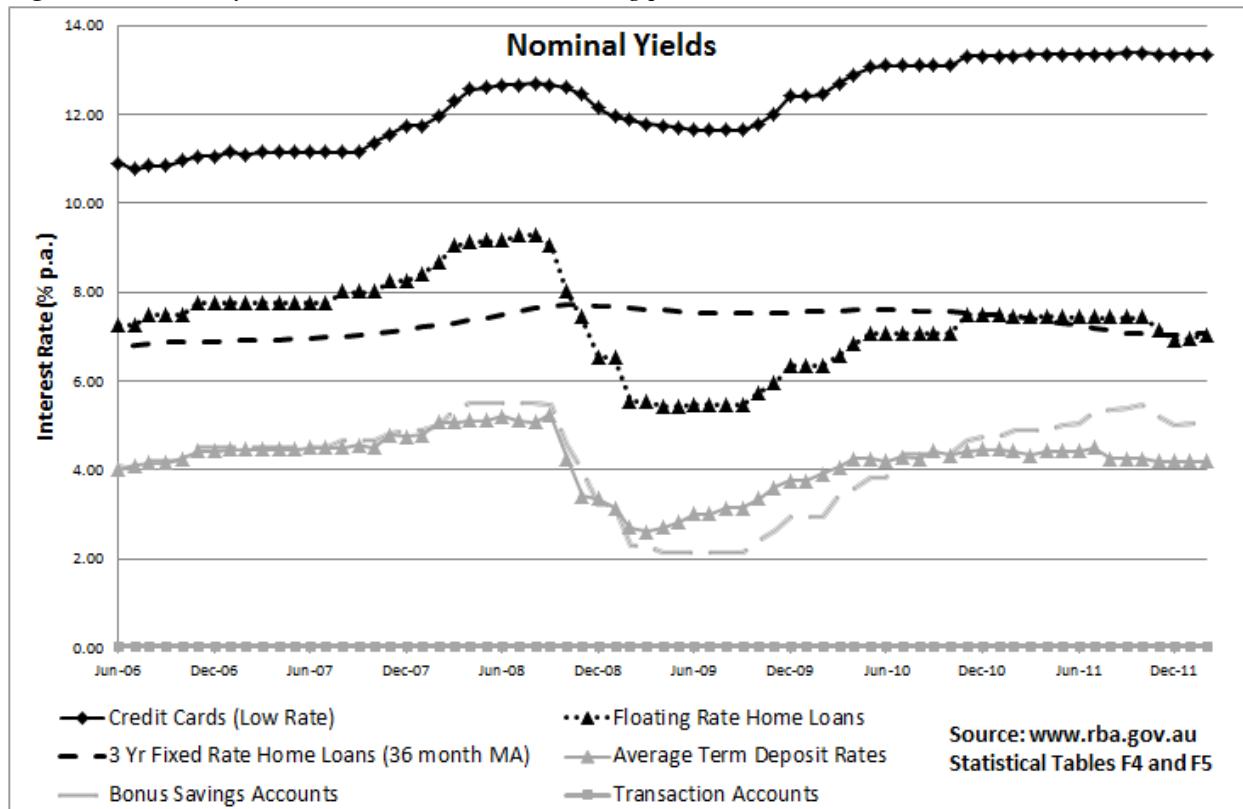
The task force agreed to test the following four options: single reference rate using inter-bank lending rates; matching reference rates using different rates for short-term and long-term deposits and loans; average reference rate (weighted by stocks of short-term and long-term loans and deposits) calculated using different rates for the short-term and long-term reference rates; and reference rate calculated using the midpoint of interest rates on deposits and interest rates on loans.

5. Testing different reference rate approaches in measuring FISIM in the CPI

The simulation below presents three approaches to choosing a *single* reference rate in measuring FISIM in the CPI; an endogenous mid-point, an exogenous inter-bank lending rate and an overall cost of funds approach.

Figure 2 below shows the nominal yields on six product categories which are held constant between the models - this data is published by the Reserve Bank of Australia (RBA). The Balances used to derive interest flows are contained in Australian Prudential Regulation Authority (APRA) statistics. These simulations using aggregated public data are not intended to replicate the measurement of FISIM in the Australian CPI which uses information sourced directly from the financial institutions, including *actual interest flows* (ABS, 2004).

Figure 2: Nominal yields on Australian retail banking products



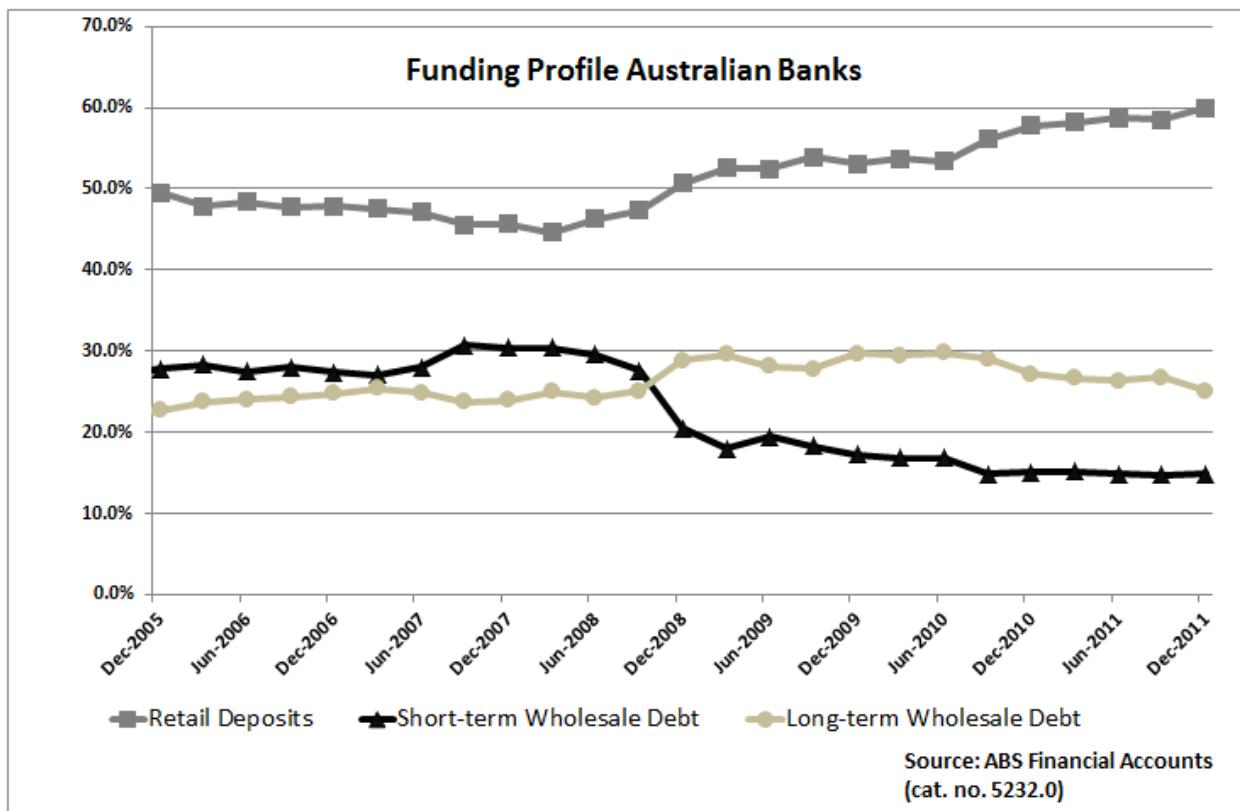
Effective yields are preferred to advertised or list price yields in the price measurement of FISIM as they exclude the default risk premium by measuring the actual flows and balances each period. This is consistent with the national accounts approach where FISIM is based on the perspective of the borrowers who pay the extra interest that is necessary to cover the anticipated cost of defaults, not on the perspective of the banks (Reinsdorf, 2011).

The first reference rate considered is an *endogenous mid-point* of the weighted average borrowing and lending rates, consistent with the ABS approach to the measurement of FISIM since it was introduced into the CPI in the September quarter 2005.

The second approach uses an *exogenous* reference rate derived from market rates that can be considered a possible service free market-clearing rate. 2008SNA [6.166] notes “the rate prevailing for inter-bank borrowing and lending may be a suitable choice as a reference rate.” For practical reasons we consider the market rates for 90 Day Bank Accepted Bills for all products.

A third consideration is a *cost of funds* approach where margins on retail deposit and loan products are derived from a benchmark rate that represents a financial institution’s overall funding costs. In such a model we assume that financial institutions are funded through retail deposits (households and business), short-term wholesale debt (money markets) and long-term wholesale debt (AA rated corporate bond market). The relative shares of each source of funds for Australian banks over time is derived from liability data from the Australian Financial Accounts (ABS cat. no. 5232.0) and shown in Figure 3 below. Note this is not a complete picture of the funding costs faced by financial institutions as the hedged costs of borrowing offshore are ignored, as are sources of funds such as securitised assets that are important for smaller and regional financial institutions.

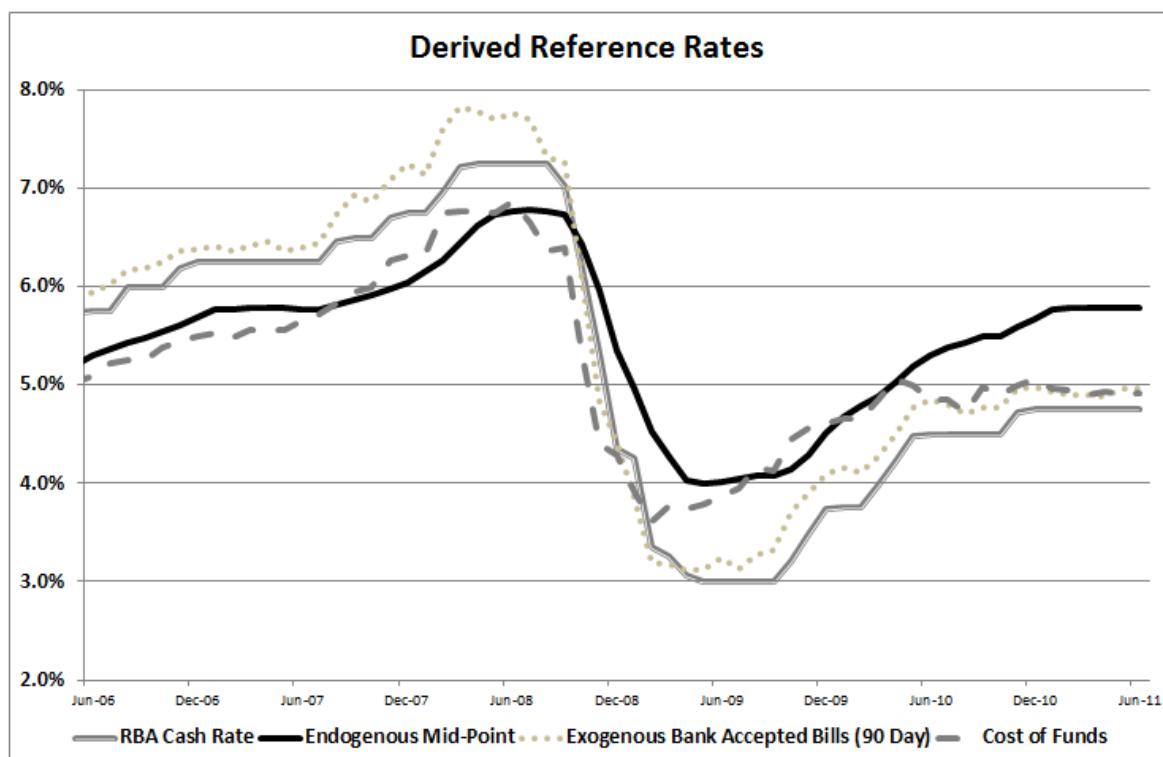
Figure 3: Major sources of funds for Australian Banks



The three approaches produce noticeably different reference rates, see figure 4 below, partly as a result of the unique nature of the Australian banking market, and due to the specific effects of the global financial crisis on each reference rate model. In particular;

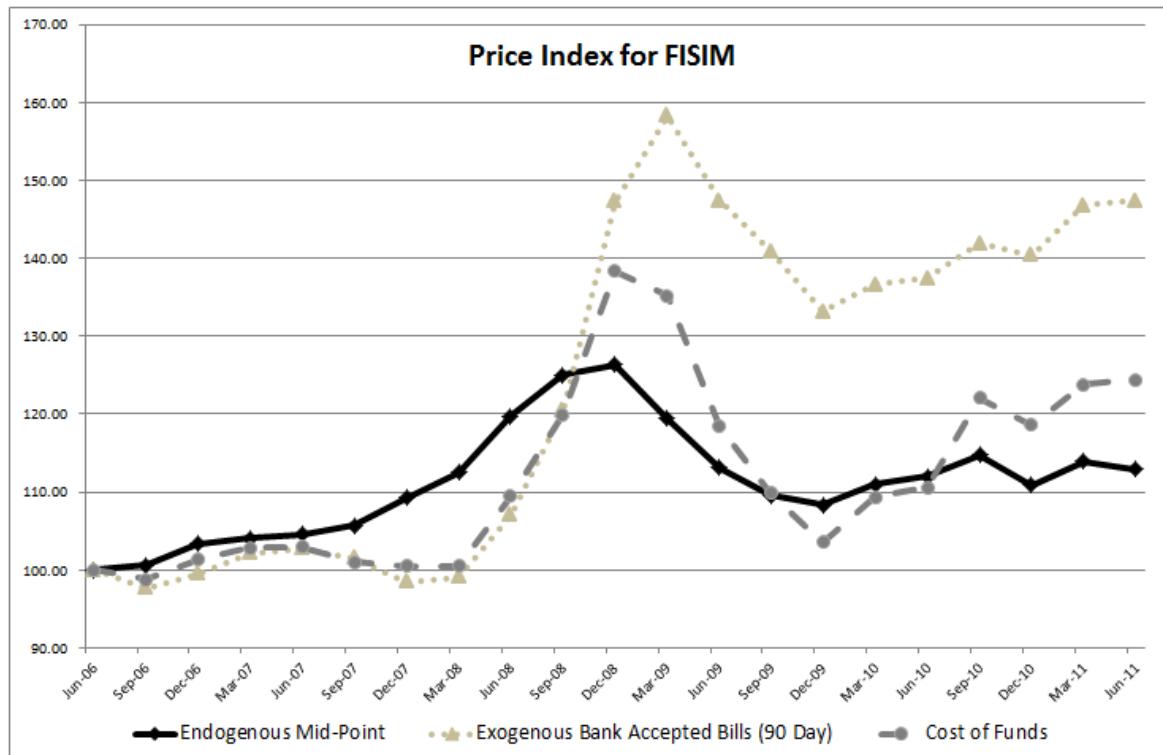
- The Australian home loan market is dominated by floating rate loans that have a strong correlation to the Reserve Bank of Australia's key monetary policy lever – the overnight cash rate. Historically floating rate loans have made up 80 percent to 90 percent of the mortgage market.
- Australian financial institutions have a relatively heavy reliance on wholesale borrowing relative to international peers – due to the asymmetry between domestic loans and deposits. At the height of the GFC short term money markets froze as credit became scarce due to counterparty risks, driving up the risk premiums on such funds. Australian banks have since reduced their reliance on wholesale short term funding given the volatility of debt markets, securing more stable deposit funding though historically generous retail deposit rates relative to the cash rate.

Figure 4: Comparison of derived reference rates and RBA cash rate



The price impact between the three different reference rate models is significant. Keeping the stocks (product balances) and flows (product interest) constant, the following price change in FISIM is observed, see figure 5 below. It should be noted that the rise in the four quarter moving average of the Australian CPI (which is used to index the balances each quarter) from June quarter 2006 to June quarter 2011 was 15.8%.

Figure 5: Price Index for FISIM under the three different reference rate models



A comparison of the simulated series for different reference rate models shows that the mid-point series appears the most stable as it was insulated in part from the sudden movements in policy rates and market rates that characterized the GFC. The large rise in the exogenous reference rate series (90 Day Bank Bills) can be explained by the rise in the default risk premiums on short term money at the onset of the GFC, leading to an initial squeeze on lending margins (including negative prices on fixed rate loans). The cost of short term wholesale funds then dropped in response to emergency cuts in policy rates, leading to an expansion in loan margins and a sudden rise in the price of FISIM due to the asymmetric nature of the retail banking sector in Australia. As policy rates normalized the price of FISIM fell back and the series stabilized, though the risk premium on short term money remained above pre GFC levels. The ABS mid-point reference rate is based on the *actual yields* calculated on financial stocks and flows, and hence the reference rate and price change measures are free of this default premium which is excluded from the production of FISIM. The mid-point reference rate moderated the effects of sudden movements in policy and market rates on the FISIM price series.

Table 1: Summary of single reference rate approaches

Reference Rate Model	Advantages	Disadvantages
Endogenous Mid-Point	Practical and pragmatic in the current paradigm. Insulates the methodology in times of financial market instability. Using actual yields it excludes default risk premiums.	Banks increased cost of funds not explicitly captured in the reference rate as wholesale borrowing is excluded – incorrectly recording increases in loan margins. Persistent issue with fixed rate products and reflecting the term structure in the reference rate.
Exogenous Interbank Lending Rate	Easily available measure on the current cost of money in the market.	Highly volatile during the GFC, distorts price movements when yields are flat. Some exogenous reference rates might be artificially low in times of crisis due to emergency policy settings. Persistent issue with fixed rate products and reflecting the term structure in the reference rate.
Cost of Funds	A theoretically robust approach that captures the broad funding considerations banks face when pricing retail products.	Complexity – issues such as hedging foreign currency. Sheer volume of input data required for a complete cost of funds model. Persistent issue with fixed rate products and reflecting the term structure in the reference rate.

6. Conclusion

The pragmatic choice by the ABS to use an endogenous mid-point reference rate as the average of the prevailing interest rates on deposits and loans was validated, as it kept the reference rate between the deposit and loan yields. This partially insulated the FISIM price measure in the CPI from the high short-term

volatility in market and policy interest rates during the height of the GFC. This enabled the FISIM measurement to reflect the actual changes faced by household lenders and borrowers during the GFC. Using the effective interest rates also excluded the default risk premiums.

However the CPI deposit and loans series, that includes FISIM as the dominant component, still exhibited large quarter on quarter movements at the height of the GFC and was difficult to interpret. A key source of this volatility was the impact of the term risk with price movements on fixed rate products being determined by a benchmark reference rate that itself was driven by current interest rates. Products such as fixed rate home loans and term deposits would show smoothed yields, whilst the reference rate was being driven by the large volumes in floating rate home loans and at-call deposits which respond to shorter term pricing signals such as the RBA cash rate. These fixed-rate products should be priced off reference rates that will account for the varying term structures for products. This would result in using multiple reference rates or term adjusted reference rates.

Recent international efforts have focused on reaching a consensus on the best methodology to deal with term risk. Similarly issues surround wholesale funding to banks and the appropriateness of a cost of funds approach are being considered. The ABS is actively involved in all the methodological discussions in the international statistical community on the treatment of FISIM in economic statistics. As a member of the ISWGNA task force, the ABS agreed to undertake testing of various options of reference rates suggested by the task force.

In line with methodological developments the ABS will build public confidence in the FISIM measure by increasing the transparency of the calculation processes and interpretability of the final results. The ABS is investing efforts into replicating the CPI FISIM index based on public datasets and the published methodology with the aim of increasing its predictability and understanding. The ability of key users to forecast and interpret the FISIM series is a major consideration for the ABS in re-introducing FISIM into the headline CPI, and methodological developments should be considered in this context.

REFERENCES

- Australian Bureau of Statistics, *Information Paper: Experimental Price Indexes for Financial Services*, 2004. (cat. no. 6413.0). Available at www.abs.gov.au
- Australian Bureau of Statistics, *Information Paper: Outcome of the 16th Series Australian Consumer Price Index Review*, December 2010. (cat. no. 6469.0). Available at www.abs.gov.au
- Australian Bureau of Statistics, *Australian National Accounts: Financial Accounts*, 2011. (cat. no. 5232.0). Available at www.abs.gov.au
- Cullen, D., Kluth, S. (2010), *A progress report on ABS investigations into FISIM in National Accounts, Consumer Price Index and Balance of Payments*. Paper presented at the ISWGNA Meeting of the FISIM Task Force March 2011. Available at <http://unstats.un.org/unsd/nationalaccount/RAmeeetings/TFMar2011/lod.asp>
- Diewert, W.E, Fixler, D, Zieschang, K. (2011), *The Measurement of Banking Services in the System of National Accounts*. Paper presented at Ottawa Group Meeting 2011. Available at <http://www.stats.govt.nz/ottawa-group-2011/agenda.aspx>
- Reinsdorf , M.B. (2011), *Measurement of Implicitly-Priced Output of Commercial Banks in the US National Accounts* . USA Bureau of Economic Analysis. Available at:

<http://unstats.un.org/unsd/nationalaccount/RMeetings/TFMar2011/PP12-1.PDF>

United Nations Statistical Commission, *Report of the Intersecretariat Working Group on National Accounts.*
<http://unstats.un.org/unsd/statcom/doc12/2012-4-NationalAccounts-E.pdf>

Schreyer, P. (2009), *A General Equilibrium Asset Approach to the Measurement of Nominal and Real Bank Output: Comment*, pp. 320-328 in Price Index Concepts and Measurement, W.E. Diewert, J. Greenlees and C. Hulten (eds.), Studies in Income and Wealth, Volume 70, Chicago: University of Chicago Press.