



Information Paper

Outcome of the 16th Series Australian Consumer Price Index Review

Australia

December 2010

I N Q U I R I E S

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Series Australian
Consumer Price Index
Review**

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December 2010

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AUSTRALIAN BUREAU OF STATISTICS

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PREFACE

Since 1960, when the Consumer Price Index (CPI) was first compiled, the ABS has maintained a program of periodic reviews of the CPI. The 16th series CPI review was a comprehensive review, a systematic examination of CPI concepts, methodologies and data sources, undertaken to ensure that the index continues to meet community needs.

The issues considered in the review of the 16th series CPI were set out in the Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0) released on 15 December 2009. Following the release of the paper, there was extensive public consultation. A CPI Review Advisory Group was established, which represented a broad cross-section of CPI users, to provide advice to the ABS. I would like to thank all members of the public who provided submissions, and all the members of the Advisory Group who have given their time freely to help with this exercise. This paper contains information on each of the issues considered during the course of this review, and outlines the ABS view on each.

Decisions about changing any aspect of the CPI are generally extremely important and often difficult to make. The decisions which have been taken represent an on-balance view of the sort of CPI best suited to meet the varying requirements of the broader Australian community, now and into the next decade.

The 16th series CPI will be introduced in the September quarter 2011 and will be linked to the 15th series CPI at the June quarter 2011. A further information paper will be released about one month before the introduction of the 16th series CPI providing details of the new index, including the weighting pattern that will be adopted.

The ABS will arrange information sessions in early 2011 to discuss with the community the outcomes of the review and I encourage all interested users to attend.

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ABBREVIATIONS

| | |
|---------------|---|
| ABS | Australian Bureau of Statistics |
| ALCI | Analytical Living Cost Index |
| ARP | Average Retail Prices |
| ASNA | Australian System of National Accounts |
| BLS | US Bureau of Labor Statistics |
| COICOP | Classification of Individual Consumption According to Purpose |
| COLI | Cost of Living Index |
| CPI | Consumer Price Index |
| CPICC | Consumer Price Index Commodity Classification |
| CURF | confidentialised unit record file |
| FISIM | financial intermediation services indirectly measured |
| GDP | gross domestic product |
| GFCF | gross fixed capital formation |
| HEC | Household Expenditure Classification |
| HES | Household Expenditure Survey |
| HFCE | household final consumption expenditure |
| I-O | input-output |
| ILO | International Labour Organization |
| IMF | International Monetary Fund |
| IOPC | Input-Output Product Classification |
| MFE | monetary final expenditure |
| OECD | Organisation for Economic Co-operation and Development |
| ONS | Office for National Statistics |
| OOH | owner-occupied housing |
| PBLCI | Pensioner and Beneficiary Living Cost Index |
| PPP | purchasing power parity |
| RBA | Reserve Bank of Australia |
| SDDS | Special Data Dissemination Standard |
| SIH | Survey of Income and Housing |
| SNA | System of National Accounts |
| SPI | spatial price index |
| SNZ | Statistics New Zealand |
| UN | United Nations |

INTRODUCTION

BACKGROUND

The consumer price index (CPI) is an important economic indicator. It provides a general measure of changes in prices of consumer goods and services acquired by Australian households. The CPI is used for a variety of purposes, such as in the development and analysis of economic policy, the adjustment of wages and pensions and in individual contracts. Because of this, the CPI directly or indirectly affects all Australians.

Since 1960, the ABS has maintained a program of periodic reviews of the CPI to ensure that it continues to meet community needs. The present 15th series CPI, which uses a 2003-04 weighting base, was first published in the September quarter 2005 CPI release.

THE 16TH SERIES REVIEW

The ABS commenced work on the 16th series review of the CPI in 2009. This information paper outlines the outcomes of the review and sets out the decisions taken regarding the 16th series CPI.

CONSULTATION PROCESS

The ABS has undertaken extensive public consultation about the 16th series CPI. This phase commenced on 15 December 2009 with the release of Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0). The ABS sought the views of interested parties in both written submissions and through public hearings during the course of the review.

Advertisements were placed in all major Australian newspapers drawing attention to the release of the information paper, inviting submissions on the issues to be considered and announcing seminars in each capital city. The ABS received 55 written submissions from organisations and individuals. A list of the submissions received on the review is provided in Appendix 1. All submissions can be viewed on the ABS website <www.abs.gov.au>.

A seminar was held in each of the eight capital cities on the CPI review and consultations were undertaken with a range of CPI users.

The ABS is grateful to all organisations and individuals who participated in the public consultation processes.

An Advisory Group (AG), comprising representatives of major users (see Appendix 2 for the composition of the group), was formed to assist the ABS in its deliberations. In addition to matters raised in Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0), other issues arising from the public submissions were also discussed with the AG.

THE 16TH SERIES CPI

The 16th series CPI will be introduced in respect of the September quarter 2011 and will be linked to the 15th series at the June quarter 2011 (see Timetable in Chapter 8). An updated weighting pattern (using 2009-10 Household Expenditure Survey data and data from other sources) will be implemented.

INFORMATION SESSIONS

The ABS intends to hold information sessions in capital cities to outline the changes to the CPI, subject to demand. The sessions will explain the outcomes of this CPI review and invite questions from the community. Their timing and location will be made available on the ABS website and via advertisements placed in major newspapers in early 2011.

OUTCOMES

1.1 The principal purpose of the CPI is household inflation measurement and the *acquisitions* approach will remain the conceptual basis for compiling the CPI. Consistent with maintaining this conceptual basis, owner-occupied housing (OOH) will continue to be measured as the change in the price of gross fixed capital formation (GFCF) of houses, net of land. A weighting pattern representative of all private households in the eight capital cities will continue to be used.

1.2 The current quarterly publication of the *outlays* based Analytical Living Cost Indexes (ALCIs) and the Pensioner and Beneficiary Living Cost Index (PBLCI) will be maintained, and the current research to determine the need for improved coverage of outlets and products in the PBLCI will be completed. Where there is a clearly demonstrated need, and additional resources are provided, other complementary quarterly price indexes on an *outlays* basis will be produced for particular population subgroups on a case-by-case basis.

1.3 There was significant demand for a monthly CPI. The ABS is persuaded there would be a significant benefit from more timely and responsive economic management if a CPI of equivalent quality to the current quarterly index were available monthly. Additional funding will be required to meet the costs involved in compiling a monthly index.

1.4 The ABS will change its measurement of financial services in the CPI to ensure that this component of the CPI is of high quality. The changes are as follows:

- a) the indirectly measured component of the Deposit and loan facilities index (i.e. financial intermediation services indirectly measured (FISIM)) will be removed from the headline CPI from the commencement of the 16th series in September quarter 2011;
- b) the Deposit and loan facilities index will comprise direct fees and charges only and will be renamed 'Deposit and loan facilities - direct fees' from the commencement of the 16th series in September quarter 2011;
- c) a new analytical series, comprising the All groups CPI inclusive of FISIM, will be published on a quarterly basis from the commencement of the 16th series in September quarter 2011;
- d) the methodology for measuring the price of FISIM will be refined for the analytical series, informed by international developments in this area. An information paper covering the developments in the measurement of FISIM and other financial services will also be released;
- e) the ABS will continue to work with data providers (financial institutions) to obtain the high quality, detailed data necessary to measure FISIM robustly; and

OUTCOMES *continued*

f) a Deposit and loan facilities index comprising direct fees and FISIM will be re-introduced into the headline CPI when the ABS is satisfied that the methodology and data are sufficiently robust to produce high quality estimates. The ABS plans to reintroduce FISIM measurement within the CPI in time for the 17th series CPI.

1.5 The ABS will investigate methodologies for other significant financial services that are currently not covered in the CPI (e.g. superannuation charges) and introduce them into the CPI when the ABS is satisfied that the methodology and data are sufficiently robust to produce high quality estimates.

1.6 Subject to availability of the additional funding required, the frequency of CPI weight updates will be increased from six-yearly to four-yearly, via a more frequent Household Expenditure Survey (HES).

1.7 To ensure a robust measure of the CPI, strategies to minimise possible sources of bias in the CPI will be continued (e.g. the use of scanner data will be explored).

1.8 The ABS will provide more information on the quality adjustment processes used in the CPI to better inform the public on circumstances where quality adjustments take place.

1.9 The ABS sees potential with the use of scanner data in the CPI, both to improve reliability and reduce data collection costs, and will continue to explore the use of scanner data for CPI and related purposes, leveraging international experience with the use of such data.

1.10 The CPI and all related series will be presented on a reference base of 2009–10 = 100.0, commencing with the September quarter 2012 CPI.

1.11 The Australian CPI will continue to use the ABS Consumer Price Index Commodity Classification (CPICC). The ABS will take action internationally to influence a revision of the Classification of Individual Consumption According to Purpose (COICOP) to address shortcomings which prevent its use as the primary product classification in the CPI.

1.12 A correspondence between CPICC and the Input-Output Product Classification (IOPC) will be compiled and published for the 16th series CPI.

1.13 The ABS will continue to produce analytical measures of underlying inflation. The current seasonal adjustment methods will be replaced by standard ABS seasonal adjustment methods. The ABS will produce seasonally adjusted estimates of the CPI, and of significant seasonal components (using standard ABS seasonal adjustment methodologies), from the commencement of the 16th series in September quarter 2011. The production of seasonally adjusted individual capital city indexes will be subject to appropriate funding. The unadjusted CPI will continue to be the official headline measure.

1.14 The ABS will publish an *All groups excluding food and energy* index as part of the analytical series, from the September quarter 2011.

1.15 The ABS will update the tradable and non-tradable series classifications, from the September quarter 2011.

OUTCOMES *continued*

1.16 The ABS will discontinue the Average Retail Prices (ARP) publication from the September quarter 2011; the June quarter 2011 release will be the final issue.

1.17 The ABS will engage in discussions with potential users of low level CPI data to discuss how their needs might best be met on a case-by-case basis. The ABS will not develop a confidentialised unit record file (CURF) of collected prices.

1.18 The ABS will explore cost effective options to expand CPI coverage beyond capital cities. However, this must be considered in the context of competing priorities within the ABS work program.

1.19 The ABS will undertake the development and publication of annual spatial price indexes (SPIs) for capital cities, subject to appropriate funding and consideration of competing priorities within the ABS work program.

1.20 The ABS will investigate annual SPIs with an expanded scope to include rest of state components, subject to appropriate funding and consideration of competing priorities within the ABS work program.

BACKGROUND

2.1 The CPI is a temporal price index for *consumption* goods and services acquired by Australian resident households. It is an important economic indicator, providing a general measure of price change. The CPI is used for a variety of purposes, such as in the development and analysis of economic policy, the adjustment of wages and pensions, and in individual contracts.

2.2 The principal purpose of the Australian CPI is to measure inflation faced by consumers to support macroeconomic policy decision making. This is achieved by providing a measure of household consumer inflation by the *acquisitions* approach. Prior to 1998 however, the index was designed primarily for income adjustment purposes, and was compiled on an *outlays* approach which reflected all *out-of-pocket* expenses (including interest payments).

2.3 As part of the 16th series review the ABS invited comment on:

- whether measuring inflation faced by households (using the *acquisitions* approach) should remain the principal purpose of the CPI in Australia;
- the role of the CPI in the face of emerging community needs; and
- the usefulness of supplementary indexes as measures of inflation affecting population subgroups.

2.4. The Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0) identified three principal purposes and corresponding conceptual approaches to constructing a CPI. These are discussed briefly below and in more detail in Appendix 3.

The acquisitions approach

2.5 If the CPI is intended to be a measure of household consumer inflation, the basket of goods and services priced can be defined as consisting of all consumer goods and services actually acquired by households during the base period (i.e. the *acquisitions* approach). Market prices for goods and services are exclusively utilised (the ABS defines market prices as inclusive of taxes, and exclusive of subsidies). Non-monetary transactions (i.e. imputed prices, such as imputed rent) and interest rate payments are excluded.

2.6 Key aspects of a CPI constructed on the *acquisitions* approach are as follows:

- expenditure on services, explicitly charged for financial services (including investment related financial services - see Appendix 3 for further clarification), non-durable and durable goods;
- indirectly measured financial services such as financial intermediation services indirectly measured (FISIM) (including investment related financial services);
- owner-occupied housing (OOH) - net acquisition of new dwellings excluding land (i.e. gross fixed capital formation (GFCF) of houses); and
- exclusion of non-monetary transactions, mortgage interest and consumer credit.

The cost-of-use approach

2.7 If the CPI is intended to be a measure of a change in living standards, the basket consists of all those consumer goods and services actually consumed (i.e. *cost-of-use*) in the base period irrespective of when they were acquired or paid for.

2.8 Some imputed expenditures are included within the scope of a CPI on a *cost-of-use* basis on the grounds that the goods and services acquired in non-monetary transactions affect *households' living standards*. To account for household welfare, flows of services to a household from durable items are measured, e.g. the services consumed by the household from residential structures owned wholly or in part by the occupants (see Appendix 4).

2.9 Key aspects of a CPI constructed on the *cost-of-use* approach, measuring goods and services consumed, are as follows:

- expenditure on services, explicit financial services (including investment related financial services), non-durable and most durable goods;
- indirectly measured financial services such as FISIM (including investment related financial services);
- imputed expenditure on services from durable goods, OOH; and
- exclusion of mortgage interest and consumer credit.

The outlays approach

2.10 When a CPI is intended to maintain the *purchasing power of incomes* (i.e. for the adjustment of incomes), the measurement of actual money flows out of the household is captured (i.e. *out-of-pocket* living expenses). The basket is defined in terms of the actual amounts paid by households during the base period to gain access to consumer goods and services (including interest payments). The capture of these interest payments is the main point of difference to alternative measures.

2.11 Key aspects of a CPI constructed on the *outlays* approach, measuring *out-of-pocket* living expenses, are as follows:

- expenditure on services (excluding financial services), non-durable and most durable goods;
- gross insurance charges;
- consumer credit charges; and
- mortgage interest on the durable good OOH.

2.12 The ABS has developed a series of analytical measures, based on the *outlays* approach, which have been designed specifically to measure the impact of changes in prices on the *out-of-pocket* living costs experienced by selected groups of Australian households. The most recent addition to this family of indexes is the Pensioner and Beneficiary Living Cost Index (PBLCI), which was developed in 2009. The ABS is currently undertaking work to improve the accuracy of expenditure estimates for the PBLCI reference population (i.e. age pensioner households and other government transfer recipient households) and to determine the need for improved coverage of outlets and products.

USER VIEWS

2.13 During the course of the review the ABS consulted with a broad cross-section of users. The views expressed on the principal purpose of the CPI fell into one of two camps.

USER VIEWS *continued*

2.14 Many of the submissions and participants at public consultation events supported the principal purpose of the CPI remaining a general measure of price inflation for the household sector and that the construction of the CPI should therefore remain on an *acquisitions* basis.

2.15 Others argued that the CPI should measure the purchasing power of incomes and should therefore be constructed accordingly. The credibility of the CPI for income indexation has been questioned in recent times, especially from groups in the community that have incomes indexed solely by the CPI, such as Commonwealth superannuants.

2.16 For example, similar issues were raised during the hearings for the 2008 Review of Pension Indexation Arrangements in Australian Government Civilian and Military Superannuation Schemes and again in submissions to the ABS CPI review.

2.17 Users also suggested that a single headline CPI cannot adequately deal with multiple purposes. Demand was expressed for a CPI whose principal purpose is the measurement of living costs. There was strong support for living cost indexes and the continued production of the existing range of Analytical Living Cost Indexes (ALCIs). Further enhancements of the ALCIs for policy purposes were sought.

2.18 The majority view from written user submissions was that the CPI should remain a measure of household price inflation. Most were in favour of retaining the *acquisitions* approach as the most appropriate method to construct the CPI.

2.19 During AG discussion, it was strongly argued that the CPI's principal purpose should remain as an input into monetary policy decision making, and that the *acquisitions* approach is the appropriate basis for this purpose. Several AG members, however, suggested that the treatment of OOH was not reflective of the experience of some Australians (due to the exclusion of interest payments).

2.20 Most AG members agreed that a single CPI cannot be expected to serve all purposes. However, the AG advised that a CPI designed to serve a specific purpose was preferable to an assortment of headline CPIs.

2.21 The AG supported the continuation and the development of alternative living cost indexes appropriate to particular population subgroups. The AG emphasised that any development of supplementary indexes should be driven by government policy as the proliferation of indexes, unless carefully managed, could lead to confusion around inflation measures.

2.22 On balance, the AG agreed that the CPI should remain a general measure of household price inflation and therefore supported the *acquisitions* approach as the most appropriate method for constructing the Australian CPI.

EVALUATION

2.23 The international CPI Manual (ILO, 2004) does not promote any one single conceptual approach for compiling a CPI but leaves the decision up to individual countries to choose the approach which they believe best suits their principal uses. In practice, the conceptual distinctions between the three approaches are unimportant for most areas of household consumption.

EVALUATION *continued*

2.24 However there are some circumstances under which the distinctions are important. OOH costs, as discussed above, are a key difference between alternative approaches.

2.25 The ABS undertook further analysis to ensure the current *acquisitions* approach for the measurement of OOH was defensible, and not impacting negatively on users of the CPI.

2.26 Analysis showed the CPI is sensitive to the choice of OOH measurement. Findings indicate, however, that using an alternative approach to housing in the headline CPI would not necessarily reduce public concern that housing costs are not captured adequately in the CPI (see Appendix 4).

2.27 The closest approximation for the measurement of consumer inflation for OOH is the *acquisitions* approach as alternative approaches capture asset prices (i.e. land), interest rate payments or non-market pricing, rendering them unsuitable for the principal purpose of measuring price inflation.

2.28 There is international support for the use of the *acquisitions* approach for general CPI construction and for OOH where the CPI is intended to be a measure of household consumer inflation. One barrier for countries attempting to produce OOH measurement on an *acquisitions* basis is the availability of data. Australian data sources are available to ensure this approach delivers accurate results.

2.29 Current methodology for the measurement of OOH is consistent with the principal purpose to measure *household inflation*.

OUTCOME

2.30 The principal purpose of the CPI is household inflation measurement and the *acquisitions* approach will remain the conceptual basis for compiling the CPI. Consistent with maintaining this conceptual basis, owner-occupied housing (OOH) will continue to be measured as the change in the price of gross fixed capital formation (GFCF) of houses, net of land. A weighting pattern representative of all private households in the eight capital cities will continue to be used.

2.31 The current quarterly publication of the *outlays* based Analytical Living Cost Indexes (ALCIs) and the Pensioner and Beneficiary Living Cost Index (PBLCI) will be maintained, and the current research to determine the need for improved coverage of outlets and products in the PBLCI will be completed. Where there is a clearly demonstrated need, and additional resources are provided, other complementary quarterly price indexes on an *outlays* basis will be produced for particular population subgroups on a case-by-case basis.

BACKGROUND

3.1 The CPI is released on a quarterly basis, on the fourth Wednesday following the reference quarter. The frequency of Australian CPI releases was investigated as part of the review to gauge if the quarterly periodicity still meets Australia's needs.

3.2 Australia is one of only two Organisation for Economic Co-operation and Development (OECD) countries, and the only G-20 (Group of Twenty Finance Ministers and Central Bank Governors) country that does not produce a monthly CPI.

3.3 Australia is a subscriber to the International Monetary Fund (IMF) Special Data Dissemination Standards (SDDS) which sets guidelines for the compilation of statistics for those countries which wish to access international capital markets. The standards recommend that the CPI should be produced monthly. Australia exercises a flexibility option to maintain a quarterly periodicity for the CPI. International Labour Organization (ILO) guidelines also recommend monthly compilation, but allow the index to be produced less frequently if the country lacks the resources or if there is negligible user demand (ILO, 2004).

USER VIEWS

3.4 Nearly half of all submissions received in the consultation phase of the review addressed the issue of how often the CPI should be released. Within the AG, there was also keen interest and debate on the periodicity issue. The interest in the compilation frequency of the CPI contrasted with that of the last major review in 1998, where this topic attracted very little public comment.

3.5 Demand for a monthly CPI was strongest from organisations with an interest in economic measurement and analysis or the financial sector. Submissions from this group commented that having access to a greater quantity of data in a more timely manner will enable users to identify trends and make informed decisions.

3.6 In particular, the CPI has a central role in the Reserve Bank of Australia's (RBA) monetary policy development. In the RBA's submission to the review it was noted that, " ... in Australia, only four readings of the CPI are released each year, versus twelve in almost all comparable economies. More timely data would help provide an earlier indication of the trend in inflation, which is particularly important around turning points. It could also be helpful in distinguishing between signal and noise" (Reserve Bank of Australia, 2010).

3.7 Organisations more concerned with the CPI for assessing social welfare or indexing contracts were not explicitly opposed to a monthly CPI, but confirmed that a quarterly CPI was adequate for their current needs.

3.8 Some users expressed concern that monthly seasonal factors may increase the volatility or 'noise' reported in the CPI. The ABS is unable to test the validity of this claim without the monthly data. Seasonal adjustment of the CPI is discussed in Chapter 6.

USER VIEWS *continued*

3.9 There was a clear message from all users of CPI data that the ABS should only consider a monthly CPI if the quality of the index will not be compromised.

3.10 Users noted that the emergence of private sector monthly inflation gauges indicated a demand for a monthly CPI. However this was not seen as a substitute for an official monthly measure.

EVALUATION

3.11 Given the strong demand from key users and the results from the research undertaken, the ABS supports the view that Australia would be best served by a monthly CPI.

3.12 A monthly CPI would improve the timeliness and quantity of data available to policy makers. The series would better conform to the IMF and ILO guidelines, which would improve international comparability. While the full benefits to the Australian economy are difficult to quantify at this early stage, one benefit for the RBA would be the ability to adjust the official cash rate target in response to a more timely indicator of inflationary trends available one month after the reference period rather than the current delay of up to three months. An adjustment of 25 basis points on the cash rate target results in changes of the order of several hundreds of millions of dollars in interest payments by Australian households. Discussions with the Bank of England have confirmed the value of the monthly CPI in the UK. They noted a number of historical occasions in which the absence of a monthly CPI would have meant delays in adjusting monetary policy settings, at considerable cost to the national economy.

3.13 The ABS has evaluated the viability of producing the CPI on a monthly basis and can produce a monthly CPI measure of equivalent quality to the current quarterly measure. The monthly CPI would be constructed taking international best practice into consideration, e.g. released within one calendar month of the end of the reference period. The index would cover all private households in the eight capital cities. Further details are outlined in Appendix 5.

3.14 A monthly CPI is expected to be first published within two to three years of receiving the required funding, estimated at an initial investment of \$6 million, and an additional cost of \$15 million per annum. It is estimated that it would take one year to evaluate and improve CPI price samples, increase the number of staff and to implement computer systems. The ABS then requires at least a year to run the monthly series parallel to the current quarterly series to evaluate the quality and robustness of the index. This would also ensure that a 'percentage change from the corresponding month of the previous year' figure can be included in the first monthly release.

3.15 The monthly index numbers as well as percentage change from the previous month and corresponding month of the previous year would be released. They would be released for the eight capital cities and the weighted average of the capital cities to the expenditure class level.

3.16 In addition to publishing monthly and annual CPI figures, the quarterly CPI headline index number will be made available. The existing quarterly indexes (i.e. March, June, September and December) will continue to be published. They will be calculated as an arithmetic average of the three monthly index numbers.

OUTCOME

3.17 There was significant demand for a monthly CPI. The ABS is persuaded there would be a significant benefit from more timely and responsive economic management if a CPI of equivalent quality to the current quarterly index were available monthly. Additional funding will be required to meet the costs involved in compiling a monthly index.

CHAPTER 4

EVALUATION OF THE DEPOSIT AND LOAN FACILITIES INDEX

BACKGROUND

4.1 The Deposit and loan facilities index in the CPI measures changes in the price of banking services provided to households. Households pay for these banking services in two ways. Explicit fees are paid for account keeping services and certain transactions. These are termed direct fees. Banks also earn income by lending funds at a higher rate of interest than they pay on deposits. The difference between the interest paid by borrowers and the interest received by depositors is the total of indirect fees paid for the banking services.

4.2 In order to allocate the indirect fees between depositors and borrowers the concept of a reference rate of interest is utilised. For a borrower, the indirect service charge is given by the interest rate margin (the difference between the interest rate paid by the borrower and the reference rate) multiplied by the balance on the loan. For a depositor, it is the interest rate margin (the difference between the reference rate and the interest rate received by the depositor) multiplied by the deposit account balance. The ABS has adopted the practical approach of setting the reference rate at the mid-point of the average deposit and lending interest rates. A reference rate determined in this way could be interpreted as a proxy for the rate that would be struck in the absence of financial intermediaries by depositors dealing directly with borrowers. A detailed description of the methodology for determining the price of banking services can be found in Appendix 6 of this paper and in Information Paper: *Issues to be considered during the 16th series Australian Consumer Price Index (CPI) review* (cat. no. 6468.0).

4.3 An equivalent approach for the measurement of financial sector services is adopted in the National Accounts where the term financial intermediation services indirectly measured (FISIM) is used.

RECENT DEVELOPMENTS

4.4 The Deposit and loan facilities index was implemented as part of the 15th series CPI in 2005 following the outcomes of the last major CPI review (the 13th series review, 1998). Prior to implementing the index in the CPI, the ABS published an experimental series for the Deposit and loan facilities index. Despite some early concerns from users about the index, the series generally was well behaved.

4.5 Volatility in the index during the global financial crisis (GFC) prompted concerns from users about the behaviour of the index. Recent experience has shown that movements in the index are highly sensitive to the detailed level of data available from financial institutions. The behaviour of related indexes during periods of heightened financial market volatility prompted a broader international debate surrounding the measurement of FISIM.

RECENT DEVELOPMENTS

continued

4.6 There was strong support during the 16th series CPI review for a detailed reassessment of the Deposit and loan facilities index. The ABS decision to remove the indirect fees component of the index is a result of in-depth analysis and close consultation with users and data providers. The decision to change this aspect of the CPI is a significant outcome from the review and reflects an on-balance assessment based on a range of information. Despite concerns about the accuracy of the index, users acknowledged the importance of including these services in the CPI.

4.7 Work is underway to strengthen data sources and implement improved methodologies with the intention to reintroduce the indirect fees component in the future. The ABS is currently involved in ongoing discussions within the international statistical community to resolve methodological issues. This work may take some time to complete. In the interim, the ABS will publish an analytical series of the All groups CPI inclusive of indirect fees from the 16th series.

USER VIEWS

4.8 The concerns voiced in the review primarily related to the indirect fees component of the Deposit and loan facilities index. Some of the concerns raised by users were:

- the weight assigned to Deposit and loan facilities and the consequent impact of the index on the All groups CPI;
- the volatility of the Deposit and loan facilities index, and whether this volatility is representative of indirectly measured financial service prices;
- the correlation between changes in the official cash rate target and the Deposit and loan facilities index, and whether this correlation is representative of indirectly measured financial service prices;
- the Deposit and loan facilities index sampling methodology;
- the treatment of products with fixed interest rates;
- the lack of international comparability;
- a perceived lack of transparency due to difficulties experienced in replicating the Deposit and loan facilities index, and difficulties explaining movements in the index;
- the best way to calculate the reference rate;
- the quality/robustness of the underlying data;
- the complexity of the calculation method; and
- the impact of changes in wholesale funding costs on the Deposit and loan facilities index calculation.

EVALUATION

4.9 The ABS has classified issues raised by users as conceptual, methodological or data concerns.

Conceptual concerns

4.10 There are three primary conceptual questions. First, should fees for financial services be included in a CPI? Secondly, should *indirect* fees be included in a CPI? And thirdly, should *investment related* expenditure be included?

4.11 Deposits and loans themselves are not consumption goods or services. However, financial institutions provide services such as financial intermediation (matching the requirements of borrowers with lenders), security and automatic teller machine access. These services are consumed by households and therefore fees associated with them should be included in a CPI.

*Conceptual concerns
continued*

4.12 A number of countries include direct fees in their CPIs, however Australia is the only country to include indirect fees. Householders may not observe these indirect fees as they are bundled with interest payments. These fees paid by households, however, represent genuine transactions. In addition, a CPI that incorporates only direct fees misrepresents price changes when financial institutions substitute between fees charged directly and indirectly. The ABS considers both direct and indirect fees as payment for services consumed by households and therefore concludes they should be included in the CPI.

4.13 As discussed in Chapter 2, there are several conceptual approaches for the construction of a CPI. The ABS has decided to retain the *acquisitions* approach for the measurement of household inflation. The CPI Manual (ILO, 2004) states that the scope of the *acquisitions* approach includes household expenditure on services including FISIM. This confirms that the ABS decision to include indirect fees for financial intermediation services in the CPI is supported in principle by the international statistical community.

4.14 A number of users questioned whether the inclusion of expenditure on *investment related* services (e.g. stock broking fees, real estate agent's fees and financial intermediation services on investments) was appropriate. The ABS has reviewed the System of National Accounts (SNA) and international price index literature on the concepts underpinning the treatment of investment services. These sources are consistent with the ABS interpretation regarding the treatment of investment activity in the CPI. The manuals state that the use of *services* related to investment is consumption activity and considered household expenditure, within the scope of a CPI.

4.15 In principle, service charges for superannuation products, which are not currently in the CPI, should also be included. Methodologies for their inclusion will therefore be assessed as part of the CPI forward work program.

4.16 The ABS has discussed the conclusions of the investigations with the AG and other users and there is strong support that *conceptually* both direct and indirect fees for all household deposit and loan facilities should be included in a CPI providing they can be accurately measured. However, questions have been raised regarding the behaviour of the Deposit and loan facilities index. These questions are related either to the indirect fee calculation methodology or the data used to calculate this aspect of the index. In the wake of the GFC there is a renewed debate internationally on FISIM measurement that will take some time to resolve.

Methodological concerns

4.17 A number of concerns with the methodology used to calculate the price change of indirect fees have been raised. The detailed methodology is not well understood and analysts find the index difficult to predict. The review has identified refinements capable of improving the existing methodology. However, in order to address issues with the treatment of fixed interest rate products or take into account changes in the cost of wholesale funding to banks, an enhanced methodology is required. Simplification of the existing methodology, to reduce complexity, results in a significant risk of introducing bias into the index. Further details of ABS analysis of the methodological concerns are contained in Appendix 6.

*Methodological concerns
continued*

4.18 If price movements in the All groups CPI are compared with the All groups CPI excluding Deposit and loan facilities, major differences in the two series are evident. The Deposit and loan facilities index contributes approximately 4% to the All groups CPI. Therefore, the inclusion of the index has a significant impact on the CPI. The influence of Deposit and loan facilities on the All groups CPI does not represent a problem in itself. It emphasises, however, that particular care must be taken with price measurement as any inaccuracies arising from the calculation methodology will detract from the accuracy of the CPI.

4.19 To calculate the service price for Deposit and loan facilities, interest rate margins are multiplied by base period account balances indexed by a lagged four quarter moving average of the CPI. If no changes to interest rate margins are observed in consecutive quarters, this is the only movement in the index. This has been described as introducing inertia into the CPI. This view is correct, however the effect is judged to be extremely minor and has not been the focus of the review.

4.20 The Deposit and loan facilities index is quite volatile at times and has a positive correlation with the RBA cash rate target. The major driver of the index is changes to the spread between deposit and loan yields. If the spread between deposit and loan yields increases (decreases), the index will increase (decrease). Over the life of the index, the spread between deposit and loan yields has tended to vary in response to changes in interest rates. For example, yields on transaction deposit accounts tend to remain stable (around 0%) while yields on most loan products change in response to changes in the cash rate target. This leads to a correlation between the index and the cash rate target and should be reflected as price volatility. These effects have not been isolated to the GFC and were apparent in the experimental series of the Deposit and loan facilities index as early as 2001. The rapid interest rate rises and falls associated with the GFC have simply made these effects more prominent.

4.21 The use of the mid-point reference rate methodology raises concerns due to the asymmetry in the Australian domestic banking market. Only approximately half of financial institutions' loans are funded by domestic deposits. The majority of the remainder is derived from wholesale funding (Davies et al, 2009). Some recent yield increases on loan products were attributed to increases in these wholesale funding costs. The current methodology reflects this as a price increase (incorrectly) and highlights a potential weakness in the methodology.

4.22 The ABS has examined the treatment of fixed rate products. The Deposit and loan facilities index is highly sensitive to the treatment of term deposits and fixed rate loans. Indexes calculated for these products are highly volatile in times of interest rate changes. In Australia, variable rate products dominate movements in the reference rate. Effective yields on fixed rate products move much more slowly than the reference rate. As the interest rate margin is calculated from the difference between the product yield and the reference rate, this induces a high level of price volatility on fixed rate products. Some of the index volatility could be reduced by using alternative methodologies for fixed rate products.

*Methodological concerns
continued*

4.23 A number of different reference rate scenarios have been considered to address concerns regarding: the use of a mid-point reference rate; the impact of changes in wholesale funding costs; and the treatment of fixed rate products. This is an area of ongoing international debate that will impact on a range of macroeconomic statistics produced by the ABS. International consensus on these issues is not expected in the short term.

4.24 To address sampling concerns the current procedure was evaluated. Currently a sample of a single (or occasionally two) representative product(s) is selected to represent each major product group. To overcome any issues with the sampling methodology the ABS will seek to obtain the detailed data necessary to commence constructing the index using a census of all consumer products instead of a sample. Further, to capture changes in the popularity of products over time, the ABS will conduct annual weight updates within the Deposit and loan facilities index. This will allow for inclusion of new product groups, such as online saving accounts, soon after their introduction. Both these adaptations could have a small but measurable impact on the resulting index.

4.25 To address the perceived lack of transparency, the ABS has evaluated the index against an index created using publicly available data. Overall trends (in the same direction) can be observed, however, quarterly movements cannot be accurately replicated. Some likely reasons for the differences in the two series are: publicly available data are much less detailed than the data obtained by the ABS; the ABS uses interest rates actually paid and received by households over the quarter whereas publicly available interest rates are advertised values and loan balances and are often reported at the end of the month (not an average across the month); and the ABS data covers securitised products which are generally excluded from publicly available data.

4.26 The ABS has investigated simplifying the methodology by combining data for products or product groups to make the index easier to understand and predict. However this has been found to result in significant inaccuracies in the index.

4.27 Users strongly suggested the weight of Deposit and loan facilities within the CPI was too high. The weights have been confirmed to be consistent with the methodology. Alternative data sources were used to perform an indicative recalculation of the average weekly expenditure on indirect fees and yielded similar results. It should be noted that the weight is determined by the methodology and variations of the methodology influence the weight.

4.28 An information paper on developments for FISIM measurement will be released prior to the 16th series CPI introduction in October 2011. The paper will cover, in greater detail, the rationale for the removal of the FISIM component from the CPI, the international debate over the measurement of FISIM, and the rationale for its reintroduction. Developments in measuring other financial services will be discussed in the paper.

Data concerns

4.29 The quality of the Deposit and loan facilities index has been found to be highly dependent on the accuracy and the level of detail of the input data. The ABS appreciates the considerable efforts made by providers to supply this data and the high level of cooperation received. The ABS invested significant resources to develop a robust

Data concerns continued

methodology and produced an experimental series of the Deposit and loan facilities index from September quarter 1998 to December quarter 2003. During these relatively stable economic times prior to the introduction, the quality of data received by the ABS was appropriate and the index behaved according to expectations. The GFC, however, put strain on the ABS and other international statistical agencies' abilities to measure indirect fees. Interest rate volatility associated with the GFC increased the sensitivity of some index components to data. It became apparent that, if the index is to deliver accurate results in turbulent economic times, very detailed, high quality data are required. Currently, this data is not universally available from financial institutions. It is also a reality that from time to time, financial institutions will revise data supplied to authorities. This often occurs too late to incorporate the changes in the CPI.

4.30 The ABS will continue to work with data providers to obtain the high quality, detailed data necessary to measure indirect fees robustly. Negotiations are taking place to secure improved quality, product level data and consistency. The ABS will continue to work on data quality until it is sufficient for the index. This is unlikely to be realised in the short term.

Conclusions

4.31 Conceptually, both direct and indirect fees for Deposit and loan facilities should be included in the CPI. However, the GFC has demonstrated that the ABS methodology used to calculate indirect fees is not sufficiently robust, and the data are not currently available, to produce a high quality estimate of price change under all economic circumstances. The ABS will continue to work with the international statistical community and data providers to resolve outstanding issues and reach a solution consistent across the range of macroeconomic statistics, which includes calculation of indirect fees, that delivers improved accuracy under all economic conditions. From the introduction of the 16th series CPI in September 2011, indirect fees will be excluded from the headline CPI and an analytical series covering the All groups CPI inclusive of indirect fees will be published separately. Direct fees will continue to be included in the headline CPI, consistent with other international statistical agencies.

OUTCOME

4.32 The ABS will change its measurement of financial services in the CPI to ensure that this component of the CPI is of high quality. The changes are as follows:

- a) the indirectly measured component of the Deposit and loan facilities index (i.e. financial intermediation services indirectly measured (FISIM)) will be removed from the headline CPI from the commencement of the 16th series in September quarter 2011;
- b) the Deposit and loan facilities index will comprise direct fees and charges only and will be renamed 'Deposit and loan facilities - direct fees' from the commencement of the 16th series in September quarter 2011;
- c) a new analytical series, comprising the All groups CPI inclusive of FISIM, will be published on a quarterly basis from the commencement of the 16th series in September quarter 2011;
- d) the methodology for measuring the price of FISIM will be refined for the analytical series, informed by international developments in this area. An information paper covering the developments in the measurement of FISIM and other financial services will also be released;

OUTCOME *continued*

e) the ABS will continue to work with data providers (financial institutions) to obtain the high quality, detailed data necessary to measure FISIM robustly; and

f) a Deposit and loan facilities index comprising direct fees and FISIM will be re-introduced into the headline CPI when the ABS is satisfied that the methodology and data are sufficiently robust to produce high quality estimates. The ABS plans to reintroduce FISIM measurement within the CPI in time for the 17th series CPI.

4.33. The ABS will investigate methodologies for other significant financial services that are currently not covered in the CPI (e.g. superannuation charges) and introduce them into the CPI when the ABS is satisfied that the methodology and data are sufficiently robust to produce high quality estimates.

INTRODUCTION

5.1 There are a number of strategies available to keep the CPI contemporary in a dynamic economy. As part of the review the ABS has considered the frequency of weight updates, quality adjustments in the CPI, the use of scanner data, re-referencing the CPI and related series, and the classification used to compile and publish the CPI.

Frequency of weight updates

BACKGROUND

5.2 The Australian CPI measures the change over time in the price of a fixed basket of goods and services acquired by household consumers. In compiling the CPI, price movements for the different items are combined using weights which represent the relative importance of each of the items to the total expenditure of the CPI population group. The quantities underlying the base period expenditures remain fixed over the life of the basket, with the expenditures being updated by the observed price changes in each period.

5.3 Over time, the expenditure patterns of consumers change in response to factors such as changes in relative prices, changes in tastes, changes in disposable income and the introduction of new products. In order to maintain the relevance of the CPI it is important to update the item weights to reflect current expenditure patterns.

5.4 The ABS currently updates the fixed items of the CPI basket every six years. The periodicity of the Household Expenditure Survey (HES) and the updating of the CPI weights in Australia do not meet the minimum standards in the ILO Resolution on CPIs, which recommends weights be updated at least once every five years.

USER VIEWS

5.5 During the consultation process of the review there was also considerable demand from users for the ABS to increase the frequency at which the CPI weights are updated to ensure the weights respond to changes in household spending patterns.

EVALUATION

5.6 As consumer expenditure patterns change over time, a fixed set of weights used in the CPI runs the risk of becoming unrepresentative, and can lead to potential item (or upper level) substitution bias. Item substitution occurs when households react to changes in relative prices by choosing to reduce purchases of goods and services showing higher relative price change, and instead buy more of those showing lower relative price change.

5.7 Like most CPIs, the Australian CPI is calculated using a base-weighted Laspeyres-type index formula (a modified Laspeyres index) which keeps quantities fixed between major revisions but allows prices to vary. The restriction imposed on the CPI by keeping the quantities fixed and not allowing substitution among goods in response to relative price

*Frequency of weight
updates continued*

EVALUATION *continued*

change results in item substitution bias. This is essentially a divergence between the measured CPI and an 'ideal' index.

5.8 Quantitative estimates of item substitution bias in CPIs are therefore typically undertaken by comparing an index using the fixed basket approach to a superlative index, such as the Fisher index. Superlative indexes make use of both beginning-of-period and end-of-period information on both prices and quantities (expenditures), thereby accounting for substitution across items (the requirement for end-of-period information in real time is the reason this type of index is an impractical option for statistical offices for the compilation of the CPI).

5.9 The ABS constructed a retrospective superlative index to provide an estimation of item substitution bias in the fixed weight Australian CPI for the five year period between June 2000 and June 2005.

5.10 Whilst the economic literature identifies five main sources of bias in CPIs, this analysis focuses on one type only – item substitution bias – in the context of the frequency of weight updates in a fixed-base index. The results in the analysis in this paper should not be taken to equate to the total bias in the CPI, which will be the net sum of all sources of bias. For a brief discussion of the other sources of bias and steps that the ABS takes to minimise such biases in the Australian CPI, see Appendix 2 of the ABS Information Paper: *Issues to be considered: 13th series Consumer Price Index Review 1997* (cat. no. 6451.0).

5.11 The analysis found that the All groups CPI was upwardly biased (as measured by the difference between the Laspeyres index and the Fisher index) by 1.2 percentage points at the end of the five year period – 0.2 of a percentage point per year on average – due to the inability of the fixed-base index to take account of the item substitution effect. For more details see Appendix 7.

5.12 These results should be considered with caution, as the period chosen (2000 to 2005) may not be typical. For example the introduction of the GST in 2000 may have altered consumer behaviour, however it is also worth noting that similar analysis undertaken by Statistics New Zealand (SNZ) to help inform the discussion on the frequency of CPI weight updates supports the ABS findings.

5.13 SNZ re-weights its CPI every three years, and demonstrated how the index might have tracked over a six year period in which weights were fixed. The results showed that the simulation in holding weights constant for a further three years (i.e. mirroring the ABS practice of six-yearly weight updates) resulted in an additional (average) annual 0.2 percentage point growth in the index.

5.14 The findings of both sets of analysis show that the longer the period between re-weights, the larger the impact of item substitution bias on the CPI. Table 1 and Graph 1 in Appendix 7 illustrate the cumulative nature of this bias.

5.15 To ensure changes in household spending patterns are captured and represented in a fixed weight index, and to minimise the impact of the substitution effect, it is important that weights and baskets are updated regularly. Re-weighting the Australian CPI more frequently would improve the relevance and accuracy of the index, and ensure better

*Frequency of weight
updates continued*

EVALUATION *continued*

alignment/adherence to international standards. While the results suggest a low annual level of item substitution bias, in line with international estimates, the bias is cumulative. More frequent updating of the fixed-level weights would result in the CPI being more responsive to shifting spending patterns of households, and more representative of current household expenditures.

5.16 As the measured impact of item substitution bias is upward, its effect on the CPI is to overstate the rate of inflation. Currently some \$172 billion in annual Australian Government expenses alone are tied to the CPI (DoFD, 2010).

5.17 Assuming a measured 0.2 of a percentage point annual upward bias, the potential monetary impact on annual Commonwealth government expenses would be several hundreds of millions of dollars (based on indexation to a CPI calculated under a four-yearly re-weight as compared to the current six-yearly re-weight schedule). This compares with the additional annual average cost of around \$3.5 million to implement a four yearly re-weighting of the CPI.

5.18 HES data is the most reliable source for deriving CPI weights. Alternative data sources were examined but they do not provide the socio-demographic information or the financial and employment characteristics about households which are essential for re-weighting the population subgroup indexes.

5.19 A four-yearly HES is preferred for several reasons. The upward bias appears more marked after four years; the HES is a complex survey and has a three and a half year development and processing cycle; and a four-yearly HES enables integration with the Survey of Income and Housing (SIH), which is conducted every two years. If a four-yearly HES were to occur, the next survey could be run in 2013-14 (the next HES is currently scheduled to be run in 2015-16), provided funding was available from 2011-12.

5.20 A more frequent HES would also deliver considerable benefits to a range of users including National Accounts, researchers and policy makers.

5.21 The AG supported more frequent weight updates, and all members supported the use of HES data for this purpose.

5.22 The ABS is also exploring other strategies to further minimise the item substitution effect on the CPI. One of these strategies involves the use of scanner data to improve the quality of lower level CPI weights unavailable from the HES.

OUTCOME

5.23 Subject to availability of the additional funding required, the frequency of CPI weight updates will be increased from six-yearly to four-yearly, via a more frequent Household Expenditure Survey (HES).

5.24 To ensure a robust measure of the CPI, strategies to minimise possible sources of bias in the CPI will be continued (e.g. the use of scanner data will be explored).

Quality adjustment

BACKGROUND

5.25 The concept of quality adjustment as used in the Australian CPI is based on the notion of consumer utility. The main purpose of applying quality adjustments is to preserve the concept of pricing equivalent items for a fixed basket of goods and services over time such that the price index compares 'like with like'. As products change, their components or ingredients may change resulting in an improvement or degradation in quality. It is important to note that the quality adjustment process may result either in increases or decreases in prices as a result of its application.

USER VIEWS

5.26 During the consultation phase, user comments were invited on the quality adjustment methodology used by the ABS. Some users suggested that the quality adjustment process used in the CPI is responsible for underestimating price increases (and thus underestimating the cost of maintaining a constant standard of living).

5.27 Most of the criticism directed at pricing to 'constant quality' concerns the impact on income utility and the erosion of purchasing power over time. For instance, some users claim that the CPI relates to a theoretical cost of a good (or service) in such cases irrespective of whether that item can still be obtained. They argue that in many cases no real utility is gained from the apparent change in quality and that the ABS should not be adjusting the prices. These users argue that they cannot buy the same basket of goods today as they could in the past, and that the cost of living is rising quicker than the CPI is reporting.

5.28 AG members supported the concept of quality adjustment in the CPI, however recommended an increased level of transparency for the quality adjustment process used by the ABS. It was suggested that the ABS should be more transparent in explaining quality adjustments on higher expenditure items such as motor vehicles, audio visual equipment and other large durable items.

EVALUATION

5.29 Quality adjustment is a conceptual requirement of a CPI. The international CPI Manual (ILO, 2004) advises that failure to pay proper attention to quality changes can introduce serious biases into the CPI. Quality adjustment bias arises from the statistician's inability to perfectly account for changes in the quality of items over time.

5.30 While the quality adjustment issue raises important conceptual and practical challenges, the important role assigned by macroeconomic policy makers to price statistics underlines the priority that should be attached to ensuring that price statistics are not distorted by inappropriate quality adjustment procedures. The ABS has a number of strategies in place to minimise quality adjustment bias.

5.31 The ABS publication *Consumer Price Index: Concepts, Sources and Methods, 2009* (cat. no. 6461.0) provides information on the quality adjustment methods used by the ABS and the circumstances in which they are generally applied. The ABS will improve the transparency of the documentation in future releases of that publication. The ABS will not, however, produce a CPI index excluding quality adjustment, as this would be a misleading indicator of price change.

*Quality adjustment
continued*

OUTCOME

5.32 The ABS will provide more information on the quality adjustment processes used in the CPI to better inform the public on circumstances where quality adjustments take place.

Scanner data

BACKGROUND

5.33 The ABS uses the expression *administrative by-product data* to describe information which is not obtained from conventional statistical surveys. The ABS uses such administrative data in the compilation of various CPI components such as automotive fuel, property rates, and hospital and medical services. The ABS is investigating the potential uses of *scanner data* (the electronic capture of product information at the point of sale) to assist in the compilation of the CPI and ALCIs.

5.34 The use of scanner data in the CPI should be seen as experimental. Several national statistical agencies have had success using scanner data in their CPIs, as outlined in Ivancic (2010). Statistics Norway has been using scanner data since August 2005 to compute its index for food and non-alcoholic beverages. Statistics Netherlands introduced supermarket scanner data into its CPI in June 2002. In both Norway and The Netherlands both prices and expenditure weights for a large sample of grocery items are derived from scanner data. The Swiss Federal Statistical Office also uses scanner data in its CPI.

5.35 Scanner data is collected and aggregated by retail chains and may be used to estimate unit values, changes in unit values, and household expenditure on the items offered for sale by the stores.

USER VIEWS

5.36 During the consultation phase of the review, most users supported efforts by the ABS to improve the accuracy of prices used for the CPI. The AG also supported the ABS in its endeavour to explore the uses of scanner data.

EVALUATION

5.37 The ABS sees scanner data as a rich source of information which has potential benefits across many areas of the prices program. Access to electronic data files will help reduce provider burden and the associated costs of physically obtaining prices from many stores. The use of scanner data will also enable the ABS to price a wider spread of products and from more geographical locations. Furthermore, as both unit values and quantities are available for all transactions, it should be possible to use aggregated sales data to update lower level item expenditure weights between HES cycles.

5.38 Scanner data may also enable the ABS to compare price movement differences between rural and urban locations which may provide important information on whether the CPI needs to cover a wider geographic coverage than capital cities.

5.39 Utilising scanner data for the CPI will not replace field collection operations entirely. The ABS estimates that there are potential scanner data sources for use in components that contribute around 50% of the weight of the CPI basket (as at June 2010).

*Scanner data continued*EVALUATION *continued*

5.40 It is clear that undertaking this work will require significant effort. Statistical organisations that have commenced using scanner data for their CPIs have advised that any potential savings from reducing the current price collection operations are at least partly offset by the added cost of managing and quality assuring the large volumes of scanner data.

OUTCOME

5.41 The ABS sees potential with the use of scanner data in the CPI, both to improve reliability and reduce data collection costs, and will continue to explore the use of scanner data for CPI and related purposes, leveraging international experience with the use of such data.

Re-referencing

BACKGROUND

5.42 The ABS changes the index reference period (a process known as re-referencing) of the CPI from time to time, but not frequently. Re-referencing of indexes is undertaken to keep the level of the index manageable and usable to clients.

5.43 The index reference period is the period in which all index numbers in the CPI have a value of 100.0. The current index reference period for most of the components in the Australian CPI is 1989–90. The index reference period for the ALCIs is currently June quarter 1998 = 100.0, and for the PBLCI is June quarter 2007 = 100.0.

5.44 Re-referencing should not be confused with re-weighting. Re-referencing does not change the relative movements between periods – it merely resets the index reference period of the CPI basket to a period in which all index numbers in the CPI have a value of 100.0. Re-weighting involves introducing new weights and recalculating the aggregate index for each period which will affect the relative movements between periods.

USER VIEWS

5.45 Although the issue of re-referencing was not raised by the ABS during the public consultation phase of the review, a small number of users have requested it be considered in the context of the review.

EVALUATION

5.46 The ABS does not regularly undertake re-referencing as frequently changing the reference base is inconvenient for users, particularly those who use the CPI for contract escalation. Re-referencing may result in a small loss of detail in historic data, especially for long series. Relative movements of any series over time are not generally affected by a reference base change, except for minor differences, due to rounding, between the percentage changes published on the old base and those on the new base.

5.47 Although re-referencing incurs some cost to the ABS, the ABS is planning to re-reference the CPI and related series because some expenditure class index numbers have become either very small or very large and difficult to manage over time. For example, the September 2010 index number for the Audio, visual and computing equipment expenditure class was 14.5, whereas for the Tobacco expenditure class was 594.9.

*Re-referencing continued*EVALUATION *continued*

5.48 The ABS sees the opportunity to re-reference the CPI to 2009–10 (the 16th series CPI weight reference period) as having many advantages, including enabling all CPI and related series (including the living cost indexes) to be presented on the same reference base.

5.49 To minimise the impact on, and inconvenience to users, re-referencing the CPI and related series is expected to be undertaken one year after the implementation of the 16th series weighting pattern.

OUTCOME

5.50 The CPI and all related series will be presented on a reference base of 2009–10 = 100.0, commencing with the September quarter 2012 CPI.

Commodity classification

BACKGROUND

5.51 A CPI classification is a framework for the systematic categorisation of all goods and services acquired by the consumer household sector. The CPI classification was raised during the review to determine whether the ABS-designed CPI Commodity Classification (CPICC) required any updates.

USER VIEWS

5.52 There was limited interest during the public consultation phase of the review and from the AG on the issue of commodity classification and item coverage. There were a number of requests for a correspondence between the CPICC and the Input-Output Product Classification (IOPC) to be published. No users were opposed to the use of the CPICC as the main classification framework for the CPI and there was no interest in changing to the Classification of Individual Consumption according to Purpose (COICOP).

EVALUATION

5.53 Although few submissions commented on this issue, the ABS conducted an investigation to determine if there were any realisable gains from adopting the international standard classification (COICOP) instead of the CPICC.

5.54 In assessing the most appropriate classification for use in the CPI the ABS considered numerous criteria. The classification should: align with Australian CPI concepts; represent the economic reality faced by Australian households; and facilitate both international comparisons of CPIs and internal coherence with other ABS statistics.

5.55 The CPICC is a purpose designed classification for use in an *acquisitions* CPI. The customised classification allows items to be grouped that are substitutable and that generally display similar price behaviour in the Australian market.

5.56 COICOP is the international standard classification. It is based on an economic *cost-of-use* approach which is more closely aligned to a CPI that measures household standards of welfare.

Commodity classification
continued

EVALUATION *continued*

5.57 The different concepts underpinning the Australian CPI and COICOP lead to significant divergences, especially in the treatment of OOH. These conceptual differences between the Australian CPI and COICOP would make it necessary to alter the classification to accommodate the different scopes. A straight adoption of COICOP is not advisable for the ABS while the ABS adopts an *acquisitions* approach.

5.58 Despite these conceptual differences the CPICC is comparable to the COICOP at the top level.

5.59 Although the CPICC aligns best with the underlying concepts of the Australian CPI there are various places within ABS macroeconomic statistics (such as the Australian System of National Accounts (ASNA) Household Consumption Final Expenditure (HFCE)) which may benefit from closer classification alignment between COICOP and CPICC. There is also the need for a correspondence between the CPICC and the IOPC which is used to structure the Input-Output (I-O) tables in the ASNA.

5.60 Greater coherence between ABS statistics is the main internal driver for a classification change in the ABS. Appendix 8 contains information and further examples of where greater alignment between classifications (or creating and improving correspondences) may improve statistical coherence.

5.61 Adopting COICOP in the CPI is not expected to produce improvements due to the modifications required to make the structure suitable for the Australian CPI. However, potential gains have been identified in the development of a joint classification for use in the ASNA HFCE and CPI.

OUTCOME

5.62 The Australian CPI will continue to use the ABS Consumer Price Index Commodity Classification (CPICC), however the ABS will take action internationally to influence a revision of the Classification of Individual Consumption According to Purpose (COICOP) to address shortcomings which prevent its use as the primary product classification in the CPI.

5.63 A correspondence between CPICC and the Input-Output Product Classification (IOPC) will be compiled and published for the 16th series CPI.

INTRODUCTION

Seasonally adjusted estimates and an All groups excluding food and energy index

6.1 As part of the 16th series review the ABS has assessed the need for, and relevance of, various supplementary indexes.

BACKGROUND

6.2 The CPI measures contemporary movements in prices and reflects real world volatility that may occur, which can make it difficult for economic analysts to distinguish the volatility of short-term fluctuations from the underlying inflationary trend. To aid this analysis, the ABS produces a number of exclusion-based analytical series, which exclude certain items from the CPI basket. These analytical series are presented in Tables 9 and 10 of *Consumer Price Index, Australia* (cat. no. 6401.0).

6.3 Seasonally adjusted data are sometimes preferred in the formulation of economic policy and for economic research because they eliminate the effects of regular periodic events. The magnitude of seasonal effects can often mask the short-term underlying movements of the series. The ABS does not seasonally adjust the All groups CPI, nor does it currently produce a seasonally adjusted version of the CPI.

6.4 Seasonally adjusted CPI series are produced by a number of international statistical agencies (in addition to the headline CPI), including Statistics Canada and the United States Bureau of Labor Statistics (BLS). The United Kingdom Office for National Statistics (ONS) produces a seasonally adjusted version of an underlying inflation measure, the RPIY (All items Retail Price Index (RPI) excluding mortgage interest payments and indirect taxes).

6.5 The ABS produces two statistical measures of underlying inflation – the trimmed mean and the weighted median – using seasonally adjusted data, under the methodology developed by the RBA. These measures, which abstract from short-term volatility, are considered useful in identifying underlying trends of price level change.

USER VIEWS

6.6 During the consultation process of the review there was strong demand for a seasonally adjusted CPI to be published alongside the other analytical measures. Analysts of consumer price inflation in the Australian economy indicated that a seasonally adjusted CPI would be a useful analytical measure to understand underlying trends in prices.

6.7 In its submission to the 16th series CPI review the RBA recommended that the ABS publish three additional analytical price series: the trimmed mean based on city-level data; the weighted median based on city-level data; and a trimmed mean inflation measure calculated using the year-ended distribution of price changes.

Seasonally adjusted estimates and an All groups excluding food and energy index continued

USER VIEWS *continued*

6.8 The ABS also received numerous requests to produce and publish an *All groups excluding food and energy* index as part of the exclusion measures in the analytical series. Many countries, including the United States and Canada, publish CPI data excluding food and energy as part of their analytical series, in addition to the headline CPI. Users stated that provision of an Australian 'CPI ex food and energy' measure by the ABS would allow for better international comparisons of inflation measures.

EVALUATION

6.9 A 2008 ABS study, supplemented by more recent work, examined seasonality in the CPI. This study, using data up to December quarter 2007, found 64 of the 90 CPI expenditure class series to be seasonal. Although many expenditure classes showed seasonal influence, the All groups index did not exhibit any stable seasonality.

6.10 Given the user demand for such measures, the ABS sees merit in producing and publishing seasonally adjusted CPI estimates as part of the suite of analytical series.

6.11 The unadjusted CPI will continue to be the official headline measure. One of the long-standing features of the Australian CPI is that it is not revised in the normal course of events. However any seasonally adjusted CPI series would be subject to revisions as the estimate of the seasonal pattern is refined and updated each period as more data becomes available.

6.12 The seasonal adjustment will be undertaken using standard methodological approaches as used with other ABS publications. The seasonal factors calculated in producing seasonally adjusted indexes for the seasonal component series will also be used in the production of the trimmed mean and weighted median measures of underlying inflation (currently, the RBA undertakes the seasonal analysis and provides the ABS with the relevant factors for each quarter). The ABS will calculate seasonal factors for the 90 expenditure classes as used in the current measures only (i.e. for the weighted average of the eight capital cities). Production of additional seasonally adjusted measures, such as individual capital city indexes, will be subject to appropriate funding.

6.13 It is generally ABS policy to publish trend series derived from seasonally adjusted series. The resulting availability of a wide-range of underlying trend measures (the trend estimate, the trimmed mean, the weighted median and the 'excluding' measures) raises the question as to what trend measure the ABS would publish and promote as the CPI trend estimate. Final decisions on the presentation of seasonally adjusted analytical series and trend estimates will be detailed in the information paper to be published about one month ahead of the introduction of the 16th series CPI in October 2011.

6.14 The production of a monthly CPI (see Chapter 3) is likely to result in seasonal influences becoming more crucial in interpreting price change. At least three years of data would be required before a monthly seasonally adjusted CPI could be produced. The ABS does not support the imputation of past quarterly data to allow historic monthly seasonally adjusted data to be created.

Seasonally adjusted estimates and an All groups excluding food and energy index continued

EVALUATION *continued*

6.15 To assist users in making international comparisons and to provide an additional analytical measure of underlying inflation, the ABS will produce an *All groups excluding food and energy* index as part of the analytical series from the September quarter 2011. Details of this new measure will also be made available in the information paper prior to the introduction of the 16th series CPI.

OUTCOME

6.16 The ABS will continue to produce analytical measures of underlying inflation. The current seasonal adjustment methods will be replaced by standard ABS seasonal adjustment methods. The ABS will produce seasonally adjusted estimates of the CPI, and of significant seasonal components (using standard ABS seasonal adjustment methodologies), from the commencement of the 16th series in September quarter 2011. The production of seasonally adjusted individual capital city indexes will be subject to appropriate funding. The unadjusted CPI will continue to be the official headline measure.

6.17 The ABS will publish an *All groups excluding food and energy* index as part of the analytical series, from the September quarter 2011.

Tradables and non-tradables

BACKGROUND

6.18 In 1997 the ABS identified a need for some measure of the impact of prices of imported items to determine the extent to which price change is attributable to domestic market factors versus international factors. In September 1999 the Tradables and Non-tradables price indexes were released as part of the CPI analytical series. These indexes decompose the CPI, at the expenditure class level, into items whose prices are largely determined on the world market (tradables), or not (non-tradables).

USER VIEWS

6.19 The compilation of price indexes that decompose the CPI into tradable and non-tradable components is seen as being of particular use in analysing domestically sourced versus internationally sourced price pressures. The major user of these indexes is the RBA. The RBA is of the view that several of the classifications are out of date and may no longer be valid given changes in the local and world economies.

EVALUATION

6.20 The ABS has examined the concept of classifying CPI expenditure classes into tradable and non-tradable components as a suitable consumer price measure, and the approach used to classify expenditure classes as either tradable or non-tradable.

6.21 The tradables and non-tradables price indexes are constructed using a subjective threshold whereby expenditure classes are classified based on the trade exposure of the contributing commodities. The existing methodology will continue to be used in construction of the indexes. All commodities which are classified as importable and/or exportable will form part of the tradable component. The non-tradable component will consist of the remaining commodities.

*Tradables and
non-tradables continued*

EVALUATION *continued*

6.22 The new classifications will be implemented as part of the 16th series CPI in September quarter 2011. The updated classification of CPI expenditure classes will be provided in *A Guide to the Consumer Price Index: 16th Series*, to be released in October 2011.

6.23 The AG were supportive of the continuation of the tradable and non-tradable indexes and of the ABS decision to update the classifications.

OUTCOME

6.24 The ABS will update the tradable and non-tradable series classifications, from the September quarter 2011.

*Average Retail Prices and
the demand for price level
data*

BACKGROUND

6.25 The Australian CPI measures price change over time (i.e. a temporal measure) and as such does not provide comparisons between relative price levels at a particular date, either between products or regions (i.e. a spatial measure).

6.26 *Average Retail Prices of Selected Items, Eight Capital Cities* (cat. no. 6403.0.55.001) provides some price level information. However the Average Retail Prices (ARP) data is limited to providing price levels between the capital cities at a point in time and only for a selected number of items.

USER VIEWS

6.27 There was limited comment on the usefulness of ARP during the review consultation process. Some suggested that it needed to be expanded to cover more data items.

6.28 A number of users have requested the ABS to provide detailed price level data for analytical purposes, in particular, to compare price levels across localities.

EVALUATION

6.29 The ABS is of the view that the ARP data neither performs the function of a temporal measure nor of a detailed price level comparison (spatial measure) in a robust manner. Caveats are placed on the ARP data indicating limitations, but the data continues to be used for purposes beyond its scope. The ABS considers that the ARP data is not fit for the purpose for which it is being used.

6.30 The ABS will assess the demand for price level data more broadly beyond that available in ARP.

6.31 Consideration has been given to the establishment of some form of price level unit record file, i.e. a confidentialised unit record file (CURF). However, further investigation and previous work on this topic has highlighted many practical and legal considerations in releasing price data at the unit record level. The ABS has specific concerns regarding the legal, confidentiality and public interest implications (e.g. possible manipulation of series) of developing a general purpose CPI CURF. This concern, however, must be balanced against the genuine need for price level data for analytical purposes.

*Average Retail Prices and
the demand for price level
data continued*

OUTCOME

6.32 The ABS will discontinue the Average Retail Prices (ARP) publication from the September quarter 2011; the June quarter 2011 release will be the final issue.

6.33 The ABS will engage in discussions with potential users of low level CPI data to discuss how their needs might best be met on a case-by-case basis. The ABS will not develop a confidentialised unit record file (CURF) of collected prices.

INTRODUCTION

7.1 As part of the 16th series review the ABS has assessed the expansion of the geographical coverage of the CPI beyond the capital cities, and production of spatial price measures to complement the temporal CPI.

Geographical coverage

BACKGROUND

7.2 The Australian CPI is compiled and published separately for each capital city, with the national CPI compiled as the weighted average of eight capital cities. Prices are collected in capital cities only. These capital cities constitute the CPI reference population and represent 64% of Australian private households.

7.3 The HES sample covers expenditures for the whole of Australia, excluding very remote areas accounting for between one and two percent of the population. However, in constructing CPI weights, only expenditure data on the same defined scope of the CPI are used – i.e. households in capital cities only. The same geographical restriction applies to the collection of prices for the CPI.

7.4 Ideally the CPI population group should encompass all Australian households, but in practice this has not been feasible due to the substantial additional resources that would be required to collect prices outside the capital cities and compile reliable regional weights.

7.5 In past reviews the ABS has decided against extending the geographical coverage of the CPI on the grounds that the benefits were not seen as being commensurate with the costs. Empirical evidence from previous CPI reviews suggests that *price movements* in regional areas are not significantly different from those in metropolitan areas.

7.6 During the consultation phase of the review, user comments were invited on the need for regional indexes – expanding geographical coverage beyond capital cities, and their potential use.

USER VIEWS

7.7 Both in the submissions received and in the public seminars there was a perception that an expansion of the CPI coverage would automatically lead to a more representative measure of inflation. A number of submissions to the review supported the expansion of the geographical coverage of the CPI, generally suggesting a need to measure the living cost pressures faced by Australians in regional, rural and remote areas. Some submissions expressed the view that regional prices are often quite different from those prevailing in the capital cities.

*Geographical coverage
continued*

USER VIEWS *continued*

7.8 While most AG members favoured a CPI with the widest possible geographical coverage, it was acknowledged that the costs of undertaking such an expansion would need to be weighed up with an assessment of the benefits. It was widely agreed that the ABS explore cost effective options to increase the CPI coverage.

EVALUATION

7.9 While it is perceived that expanding the geographic coverage of the CPI would result in a more representative measure, there would be many conceptual and practical problems to overcome to ensure that the quality of the CPI is maintained. Some of these include: establishing regional price samples; obtaining robust weighting data; and ensuring a consistent approach to price collection.

7.10 The HES expenditure weights at state, capital city, and 'remainder of state' levels are sufficiently robust for CPI weighting purposes. ABS analysis using 2003-04 HES data suggests that at the national aggregate level, the expenditure patterns for areas beyond capital cities are not significantly different to capital cities. There would need to be quite a significant price movement differential between capital cities and regional Australia for there to be any impact on the headline CPI.

7.11 However, it is difficult to establish that price movements outside capital cities are different to those of capital cities. Previous ABS empirical analyses indicate that *price movements* (for food and fuel) outside capital cities exhibit similar price movements to capital cities. The ABS is undertaking some work with scanner data and is confident that, in time, this type of data will assist the ABS to assess price movement comparisons between capital cities and areas outside capital cities.

7.12 To address the perception that the CPI coverage is 'unrepresentative' the ABS will investigate cost effective options of producing state and territory based indexes for possible future use. Capital city indexes would be absorbed into the state and territory indexes, aggregating to a national index number. Initial investigations indicate that adopting a state-based approach would achieve a CPI geographic scope (i.e. population coverage) of around 98%.

7.13 Some users have requested specific regional indexes. The ABS does not see merit in constructing regional CPIs as obtaining accurate expenditure weights and price observations for specific localities outside capital cities would require a substantial increase to the HES and CPI price samples.

OUTCOME

7.14 The ABS will explore cost effective options to expand CPI coverage beyond capital cities. However, this must be considered in the context of competing priorities within the ABS work program.

Spatial measures

BACKGROUND

7.15 A spatial price index (SPI) enables price levels to be compared between geographic regions at a single point in time. Experimental work on SPIs by the ABS in 2005 showed the potential to produce estimates of price level differences across Australian capital cities. The research concluded that there were many conceptual and practical difficulties

*Spatial measures
continued*

BACKGROUND *continued*

in constructing such measures and the results of these experimental SPIs were not officially released. Due to budget constraints development work on SPIs was cut from the Prices program in 2008.

7.16 During the consultation phase of the review, user comments were invited on the importance of spatial measures and their potential use.

USER VIEWS

7.17 The review identified moderate support for the ABS to make available valid spatial comparisons of price levels across localities. Users were of the view that these types of spatial measures would provide a valuable instrument for policy making in relation to funding decisions where regional differences in the cost of living are important.

7.18 There were a variety of requests for spatial data and these covered different geographies, population segmentations, and purposes. Most interested parties expressed a desire to use spatial measures for living cost comparisons between the capital cities, although there was also some demand for spatial measures for specific regions outside the capital cities.

EVALUATION

7.19 The experimental work undertaken by the ABS on SPIs identified some conceptual and practical difficulties with using CPI price data to construct these measures. A key problem in spatial comparisons is the difficulty to precisely match products across regions using CPI data. Although items priced in the CPI basket are broadly similar, they differ in product specifications between capital cities to take account of local conditions. Only around 40% of the prices used in the CPI satisfied the across-city comparability requirement and were able to be used in the experimental SPI calculations.

7.20 In constructing the experimental SPIs the ABS acknowledged that an expenditure-based (fixed-basket) spatial measure provided an incomplete means of comparing living standards, however it represented the broadest measure able to be constructed at the time by the ABS.

7.21 If the ABS was to reinstate the SPI program the ABS would firstly need to develop a better understanding of the conceptual and methodological issues underpinning the construction of SPIs. Extensive consultation with users would also be required.

7.22 The ABS would, in constructing SPIs, need to evaluate any synergies with its commitment to participating in the Organisation for Economic Co-operation and Development (OECD) Purchasing Power Parities (PPP) program.

OUTCOME

7.23 The ABS will undertake the development and publication of annual spatial price indexes (SPIs) for capital cities, subject to appropriate funding and consideration of competing priorities within the ABS work program.

7.24 The ABS will investigate annual SPIs with an expanded scope to include rest of state components, subject to appropriate funding and consideration of competing priorities within the ABS work program.

TIMETABLE

8.1 A timetable for the introduction of the 16th series CPI was included in Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0). An indicative timetable of remaining activities leading up to the introduction of the new index follows.

6 December 2010

8.2 Release and widely distribute this information paper summarising the outcome of the 16th series review and set out the major decisions taken on the 16th series CPI.

December 2010 - June 2011

8.3 Finalise index structure and associated analytical series.

March 2011

8.4 Communicate outcomes and explain the proposed changes to the CPI via a series of seminars.

June - August 2011

8.5 Estimate new expenditure patterns and weights and link the 15th and 16th series. This task cannot be completed until the June quarter 2011 CPI is published in late July 2011.

Early October 2011

8.6 Publish the Information paper: *Introduction of the 16th Series Australian Consumer Price Index* which will summarise the major changes that will occur in the 16th series CPI and will provide the weighting pattern of the 16th series CPI and related analytical series.

8.7 Release the September quarter 2011 16th series CPI. The ABS will also release an updated *Guide to the Consumer Price Index: 16th series*. This information paper will take into account changes made with the introduction of the 16th series CPI in the September quarter 2011. The guide is designed to promote understanding of the CPI among general users. An updated *Consumer Price Index Concepts, Sources and Methods* publication will be released in due course.

LIST OF SUBMISSIONS

Submissions to the 16th series review were received from the following organisations/individuals. All submissions can be viewed on the ABS website <www.abs.gov.au>.

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Armour, S.J.
 Artakov, D.
 Australian Business Economists
 Australian Commonwealth Treasury
 Australian Council of Trade Unions
 Australian Council of Social Service
 Australian Energy Market Operator
 Australian Health Insurance Association
 Australian Workers Union
 ANZ Bank
 Bedson, G.
 Bray, R.
 Brewster, A.
 Broadbridge, L.
 Bromfield, K.
 Child Support Agency
 Colonial First State Global Asset Management
 Davies, G.
 Deakin University
 Dear, J.
 Defence Force Welfare Association
 Department of Commerce, Western Australia
 Department of Families, Housing, Community Services and Indigenous Affairs
 Department of Finance and Deregulation
 Department of Resources, Energy and Tourism
 Department of Transport, Victoria
 Department of Treasury and Finance, South Australia
 Department of Treasury and Finance, Tasmania
 Duncan, P.
 Franklin, P.
 Gibson, A.
 Green, E.
 Harrison, K.
 Hayes, T.
 Hazell, M.
 Hobsbawn, B.
 Housing NSW
 Ivancic, L.
 J.P. Morgan
 McCleary, G.
 McNiven, B.
 Page, D.
 Peterson, R.
 Pilbara Association of Non Government Organisations
 Pilbara Development Commission
 Powell, R.
 PricewaterhouseCoopers
 Real Estate Institute of Australia
 Reserve Bank of Australia
 The Royal Bank of Scotland
 Russell, M.
 Skinner, C.
 Strickland, K.
 Superannuated Commonwealth Officers' Association
 Voice, M.

16TH SERIES CPI REVIEW ADVISORY GROUP - LIST OF MEMBERS

LIST OF MEMBERS

The role of the Advisory Group was to provide advice to the ABS on the issues considered in the review. The CPI Review AG consisted of individuals with relevant economic and statistical experience drawn from a broad cross-section of CPI users. The 16th Series CPI Review AG members were:

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| <i>AG Member</i> | <i>Position</i> |
|--|---|
| Dr. Annette Barbetti | Federal President Superannuated Commonwealth Officers Association |
| Mr. Grant Belchamber (Mr Michael Fisher) (a) | Economist Australian Council of Trade Unions |
| Mr. Michael Blythe | Chief Economist Commonwealth Bank of Australia |
| Dr. Arthur Camilleri (Mr Danny O'Dea) (b) | Assistant Secretary Long-Term Budget Policy Branch Budget Group Department of Finance and Deregulation |
| Ms. Mary Cavar (Mr James Villafuerte) (a) (Mr Don Parker) (b) | Assistant Director Macroeconomics, Forecasting and Fiscal Strategy (Vic) Department of Treasury and Finance |
| Prof. Ken Clements | Professor of Economics Head, Economics, Business School The University of Western Australia |
| Prof. Kevin J. Fox (Chair) | Professor of Economics Head, School of Economics Director, Centre for Applied Economic Research The University of New South Wales |

.....

- (a) Delegate for meeting 1
- (b) Delegate for meeting 3

LIST OF MEMBERS *continued*

| <i>AG Member</i> | <i>Position</i> |
|---|--|
| Mr. Tony Gargan | Acting General Manager Forecasting Information and Performance Centrelink |
| Ms. Peggy Hausknecht | Manager Policy Modelling Department of Families, Housing, Community Services and Indigenous Affairs |
| Ms. Jacqui Phillips | Policy Officer Australian Council of Social Service |
| Mr. Michael Plumb | Head Prices, Wages and Labour Market Economic Analysis Department Reserve Bank of Australia |
| Mr. Oliver Richards (Mr Owen Freestone) (a) | Manager Prices and Income Domestic Economy Division Department of the Treasury |
| Mrs. Dallas Welch (Mr Chris Pike) (b) (c) | Deputy Government Statistician Macro-Economic and Environment Statistics Statistics New Zealand |
| Mr. Burchell Wilson (Dr. Siwei Goo) (c) | Senior Economist Economics and Industry Policy Australian Chamber of Commerce and Industry |

- (a) Delegate for meeting 1
- (b) Delegate for meeting 2
- (c) Delegate for meeting 3

ANALYSIS OF THE CONCEPTUAL APPROACHES TO CONSTRUCTING A CPI

INTRODUCTION

1. The Information Paper: *Issues to be considered during the 16th Series Australian Consumer Price Index Review* (cat. no. 6468.0) identified three principal purposes and corresponding alternative conceptual approaches to constructing a CPI. The international CPI Manual (ILO, 2004) does not promote any single conceptual approach but leaves the decision up to individual countries to choose the approach which they believe best suit their principal uses.

2. Detailed explanation of the three principal purposes and corresponding conceptual approaches to constructing a CPI and index scope is outlined below.

THE ACQUISITIONS APPROACH

3. If the CPI is intended to be a measure of household consumer inflation, it can be argued that only monetary expenditures should be included. Inflation is a monetary phenomenon measured by changes in monetary prices recorded in monetary transactions.

4. Therefore, the concept of monetary final expenditure (MFE) defines both the goods and services to be covered including neither consumption of own production (e.g., agricultural goods or owner-occupied households services) nor consumption of goods and services received as income in kind. The profile of a CPI constructed on the *acquisitions* approach, as supported by the CPI Manual (ILO, 2004), is as follows:

- MFE on services, explicit financial services (including investment related financial services), non-durable and durable goods;
- indirectly measured financial services such as financial intermediation services indirectly measured (FISIM) (including investment related financial services); and
- gross fixed capital formation (GFCF) in residential structures (land excluded) for owner-occupied housing (OOH).

5. Expenditure on a financial product serves to rearrange the individual's financial holdings by exchanging one type of financial product for another (i.e. a change in the household's balance sheet). The creation or extinction of financial assets/liabilities by lending, borrowing and repayments, are financial transactions that are different from expenditures on goods and services and take place independently of them. For example, households may borrow in order to finance final expenditure (e.g. on housing, holidays or medical services). A financial transaction merely rearranges the individual's asset portfolio by exchanging one type of asset for another, as such no consumption occurs. Expenditure on financial products is excluded from the CPI (ILO, 2004).

6. While it is agreed that no consumption occurs, elements of the transactions may attract an explicit charge or bundle an implicit service charge in addition to the provision of an asset, such as a loan. In principle, the bundling of a charge with a another monetary payment does not preclude the charge from being MFE (ILO, 2004). Financial services therefore represent consumer expenditure on the service related to financial products rather than expenditure on the financial product itself. As a service charge constitutes the purchase of a service by the household, it is included in a CPI.

7. Investment related financial services (e.g. stock broking fees, real estate agent fees) and directly and indirectly measured intermediation services, are considered MFE. See Chapter 4 and Appendix 6 for a more detailed examination of indirectly measured financial services.

THE ACQUISITIONS
APPROACH *continued*

8. Where the CPI is intended to be a measure of household consumer inflation, there is international support for the use of the *acquisitions* approach for general CPI construction and for OOH. The Harmonized Index of Consumer Prices, which is primarily designed for comparison of price development between European countries, considered the relative merits of the different approaches to OOH. Conceptually the *acquisitions* approach is preferred by Eurostat to construct the OOH component (Eurostat, 2010), even though OOH is currently excluded from the Harmonized Index of Consumer Prices.

COST-OF-USE APPROACH

9. CPIs are generally referred to as cost of living indexes (COLIs), however the term covers two specific ways in which a CPI is constructed; a fixed basket COLI approximation, constructed under the *cost-of-use* approach, or a true fixed utility COLI.

10. When the CPI is intended to approximate a fixed basket COLI, some imputed expenditures are included within the scope of the CPI on the grounds that the goods and services acquired in non-monetary transactions affect *households' living standards*. To account for household welfare the flow of services to a household from durable items is measured, including the services of residential structures that are owned wholly or in part by the occupants, that households consume (ILO, 2004).

11. Because of the conceptual and practical difficulties involved in measuring the flow of services from durable items, statistical standards tend to promote the *acquisitions* approach for the measurement of the majority of consumer durables in the National Accounts and CPI with the exception of OOH (which is measured as the flow of services from the durable good). Generally, CPIs described as *cost-of-use* are, in effect, hybrids between the *acquisitions* and *cost-of-use* approaches (see Appendix 4).

12. The profile of a CPI constructed on the *cost-of-use* approach, as supported by the ILO, is as follows:

- MFE on services, explicit financial services (including investment related financial services), non-durable and most durable goods;
- indirectly measured financial services such as FISIM (including investment related financial services); and
- imputed expenditure on the durable good OOH services.

13. Fixed basket CPIs differ in important ways from a true COLI, which is described in the CPI Manual as "...an index that measures the change in the minimum cost of maintaining a given standard of living" (ILO, 2004). A COLI follows a fixed utility approach and is not based on a fixed basket of goods.

14. Fundamental to the *cost of living* approach is the notion that the items which make up the CPI basket are allowed to change over time, as is the composition of outlets where these goods are purchased. As a result, in the cost of living approach the basket of goods is not fixed over time.

15. A COLI takes into account not only the consumer's preferences but all the non-price factors that affect the consumer's welfare and standard of living. However, it is not possible to directly observe the cost of achieving a standard of living, so a true COLI can only be approximated.

16. Theoretically, superlative indexes can be used to approximate a COLI. However in order to construct a superlative index, price and quantity (expenditure) data are required for all periods under consideration. Given that current period expenditure data are not available on a sufficiently timely basis, a superlative formula is not considered a practical measure for the routine production of the CPI (ILO, 2004).

THE OUTLAYS APPROACH

17. The *outlays* approach is mostly used when the primary purpose of the CPI is for the adjustment of incomes. An index designed to measure changes in the purchasing power of household incomes would need to be concerned with changes in the costs of all expenditures made from household income.

18. Proponents of this CPI aggregate see *purchasing power of incomes* determined by measuring actual money flows (i.e. *out-of-pocket* expenses, including interest payments) out of the household.

19. When the CPI is intended to approximate household *out-of-pocket* living expenses, mortgage interest and consumer credit charges in addition to MFE are captured. The capture of these interest payments are the main points of difference compared to other conceptual approaches. The inclusion of mortgage interest means that expenditure on a new house purchase (*acquisitions* approach) or flow of services from the dwelling (*cost-of-use* approach) are not included.

20. As the *outlays* approach differs from other aggregates by including interest, these aspects make it unsuitable for inflation targeting due to the feedback loop from changes in the cash rate target. While not specified as a reference aggregate, it is supported in the CPI Manual (ILO, 2004). Australia has several indexes based on this approach such as the ALCIs, and, prior to the 13th series, the CPI itself.

21. The profile of a CPI constructed on the *outlays* approach is as follows:

- MFE on services (excluding financial services), non-durable and most durable goods;
- gross insurance charges;
- consumer credit charges; and
- mortgage interest on the durable good OOH.

22. With the change of principal purpose and design of the CPI in 1998, the ABS developed a series of analytical measures specifically designed to measure changes in living costs for a range of population subgroups. Based on the *outlays* approach, these ALCIs have been designed specifically to measure the impact of changes in prices on the *out-of-pocket* living costs experienced by selected groups of Australian households. The most recent addition to this family of indexes was the Pensioner and Beneficiary Living Cost index (PBLCI), which was developed in 2009.

23. As with the CPI, the ALCIs are based on a fixed basket and are unable to immediately reflect changing consumer preferences and the substitutions that consumers make in response to changes in relative prices.

INTRODUCTION

1. The measurement of owner-occupied housing (OOH) in a CPI poses some complex issues which are not encountered elsewhere in the CPI basket. A house is a consumer asset with a long useful life, generally purchased on credit, with active resale and rental markets in which households participate as both buyers and sellers. This is why a consumer price index for OOH may be built around the cost of using a home, the cash outlays on a home, its assumed rental value or its purchase price. For most other commodities, including consumer durable goods, a CPI is simply based on the purchase price.

CONCEPTUAL APPROACHES
FOR MEASURING
OWNER-OCCUPIED HOUSING

2. The main alternatives for measuring inflation faced by owner-occupiers in a CPI are the *cost-of-use* approach (of which the *rental equivalence* approach is a variant), the *outlays* approach, and the *acquisitions* approach. All these approaches to OOH are conceptually sound, have a basis in economic theory, and all have their strengths and weaknesses. The choice of approach is dependent on the primary purpose of the CPI and the suitability of data sources – whether it be for measuring household inflation, for measuring changes in living standards, or used for adjustment of incomes.

3. The *cost-of-use* approach aims to estimate the actual and imputed costs of using the OOH stock in any given period. This is more complicated for housing than other consumption items because it is a durable good that delivers services over many periods, well beyond the date of purchase. Typically, the costs that are measured include interest payments of mortgages, depreciation and other recurring costs such as taxes and minor maintenance costs. The opportunity costs of investing financial assets in a house and capital gains could also be included. However, these factors are often excluded based on the argument that capital gains and foregone interest earnings are regarded as investment components of the house purchase decision, and are not relevant for the consumption of housing services.

4. The distinction between time of acquisition and time of use is particularly important for OOH. Under the *acquisitions* approach, the price of an owner-occupied dwelling is captured at purchase. The *cost-of-use* approach measures the gradual and smooth process of 'using up' the dwelling owned by the household and requires that the index measures period to period changes in the prices of the flows of services provided by the dwelling. The *outlays* approach simply measures mortgage interest payments as the principal component of OOH.

5. Expenditures and prices for durable goods are easily recorded (e.g. the price of a car or couch), whereas estimating the prices of the flows of services provided by durables like OOH is far more difficult because it cannot be directly observed. These conceptual and practical barriers can often lead to statistical agencies adopting a hybrid approach, that is, using the *acquisitions* approach to capture expenditures on consumer durables while a *cost-of-use* method (e.g. *rental equivalence*) captures the services provided by residential structures owned by the occupants.

6. The *outlays* approach reflects actual consumption-related cash outlays on owner-occupied homes made by households over the period in which the consumer good is used. In general, this includes mortgage interest payments, property taxes and maintenance and repair costs. Imputed costs are excluded by definition, as are investment-related outlays. The weight given to OOH is also generally smaller in the

CONCEPTUAL APPROACHES
FOR MEASURING
OWNER-OCCUPIED HOUSING
continued

outlays approach. If the CPI's primary use is as an escalator of money incomes, then the *outlays* approach is appropriate for such a purpose. The *outlays* approach is not so useful if the CPI is used as an instrument for monetary policy because of the circular effect of interest rates.

7. The final method of measuring prices for OOH is the *acquisitions* approach. This approach aims to measure the expenditures made on new dwellings (net additions to the housing stock) for the purposes of owner-occupation, as well as other current expenditures, e.g. maintenance costs. This method has the advantage of measuring the prices of OOH consistently with the prices of other consumer durables, such as motor vehicles and white goods. That is, purchases of housing from other private households are excluded, and the expenditure is recorded at the time it is made rather than as the value of the flow of services being imputed over the life of the asset.

8. In practice, *acquisition* measures exclude the value of land (investment component) from the value of new dwellings (consumption component). One consequence of these assumptions is that the weight assigned to OOH under the *acquisitions* concept is relatively small compared with the *cost-of-use* and *rental equivalence* approaches.

9. The CPI Manual (ILO, 2004) devotes considerable space to discussing the theoretical strengths and weaknesses of these alternative approaches and describes the data requirements for each. In section 10.5 it states: "Ideally, the approach chosen should align with the conceptual basis that best satisfies the principal purpose of the CPI" (ILO, 2004).

SHOULD AUSTRALIA ADOPT A
HYBRID APPROACH TO OOH?

10. There is considerable diversity in the way countries measure the cost of OOH in their CPIs. Due to the conceptual and methodological complexity of measuring housing costs, many countries use simplified variants of the *cost-of-use* approach (the most common being the *rental equivalence* approach). While some countries exclude OOH entirely from the CPI, most adopt a measure for housing that is consistent with the principal purpose of the CPI.

11. The 16th series CPI review identified some concerns in the wider community that in recent years the reported inflation for the OOH component of the CPI did not align well with the perceived price experience of owner-occupiers. The aim of the ABS research was to determine whether the CPI could be improved by incorporating some desirable attributes of either the *cost-of-use* or *outlays* approaches for the measurement of OOH.

12. In 2006 the ABS analysed the practical implications of using alternative treatments of OOH in the CPI (Woolford, 2006). The analysis was undertaken by constructing bilateral measures of price change for Sydney between 1998-99 and 2003-04. The analysis looked at five options which covered all three conceptual approaches.

- The *acquisitions* approach (ILO CPI reference aggregate #2) - Cost to the homeowner of purchasing the home outright, taking into consideration the costs associated with home maintenance.
 - 1) *The acquisitions approach excluding OOH components altogether.*
 - 2) *The acquisitions approach including OOH components.*
- The *cost-of-use* approach (ILO CPI reference aggregate #1) - A measure of the cost of the flow of services resulting from owning and living in a dwelling.
 - 3) *The rental equivalence approach (a simplified variant of the cost-of-use approach) which measures how much the homeowner would be willing to accept in rent for the dwelling.*
 - 4) *The full cost-of-use approach (ILO CPI reference aggregate #1) which focuses on the opportunity cost of owning and using the dwelling.*
- The *outlays approach* - A measure of change in prices that impact on the consumption-related cash outlays on owner-occupied homes.
 - 5) *The outlays approach.*

SHOULD AUSTRALIA ADOPT A
HYBRID APPROACH TO OOH?
continued

13. The analysis showed that the CPI is indeed sensitive to the choice of the concept. Depending on the proportion of the reference population that are owner-occupiers, the alternative conceptual treatments can have a significant impact on the CPI, affecting both weights and, at least, short-term measures of price change.

Table 1 - Results of 2006 ABS analysis using alternative treatments of owner-occupied housing (OOH)

| | 1998-99 | | 2003-04 | | 2003-04 | | |
|--|-------------|--------|-------------|--------|--------------|------------|-----------|
| | Expenditure | Weight | Expenditure | Weight | Laspeyres(a) | Paasche(a) | Fisher(a) |
| | \$ | % | \$ | % | | | |
| 1. Excluding owner-occupied housing | | | | | | | |
| Housing | 93.48 | 12.9 | 120.65 | 13.3 | 117.4 | 117.3 | 117.3 |
| Utilities, repairs and maintenance | 39.83 | 5.5 | 49.57 | 5.5 | 121.4 | 121.5 | 121.4 |
| Actual rents | 53.65 | 7.4 | 71.08 | 7.9 | 114.5 | .. | .. |
| All excluding housing | 632.95 | 87.1 | 783.50 | 86.7 | 116.5 | 112.7 | 114.6 |
| CPI total | 726.42 | 100.0 | 904.15 | 100.0 | 116.6 | 113.3 | 114.9 |
| 2. Acquisitions | | | | | | | |
| Housing | 164.78 | 20.7 | 210.81 | 21.2 | 121.8 | 121.5 | 121.6 |
| Utilities, repairs and maintenance | 39.83 | 5.0 | 49.57 | 5.0 | 121.4 | 121.5 | 121.4 |
| Actual rents | 53.65 | 6.7 | 71.08 | 7.1 | 114.5 | .. | .. |
| House Purchase | 61.00 | 7.6 | 77.42 | 7.8 | 129.0 | .. | .. |
| Property rates and charges | 10.30 | 1.3 | 12.74 | 1.3 | 119.2 | .. | .. |
| All excluding housing | 632.95 | 79.3 | 783.50 | 78.8 | 116.5 | 112.7 | 114.6 |
| CPI total | 797.73 | 100.0 | 994.31 | 100.0 | 117.6 | 114.4 | 116.0 |
| 3. Rental equivalence | | | | | | | |
| Housing | 241.91 | 27.7 | 299.18 | 27.6 | 115.6 | 115.6 | 115.6 |
| Utilities, repairs and maintenance | 39.83 | 4.6 | 49.57 | 4.6 | 121.4 | 121.5 | 121.4 |
| Actual rents | 53.65 | 6.1 | 71.08 | 6.6 | 114.5 | .. | .. |
| Owner-occupier rents | 148.43 | 17.0 | 178.53 | 16.5 | 114.5 | .. | .. |
| All excluding housing | 632.95 | 72.3 | 783.50 | 72.4 | 116.5 | 112.7 | 114.6 |
| CPI total | 874.86 | 100.0 | 1 082.68 | 100.0 | 116.2 | 113.5 | 114.8 |
| 4. Cost-of-use | | | | | | | |
| Housing | 121.12 | 16.1 | 305.97 | 28.1 | 247.4 | 234.6 | 240.9 |
| Utilities, repairs and maintenance | 39.83 | 5.3 | 49.57 | 4.6 | 121.4 | 121.5 | 121.4 |
| Actual rents | 53.65 | 7.1 | 71.08 | 6.5 | 114.5 | .. | .. |
| Owner-occupier user costs | 17.34 | 2.3 | 172.58 | 15.8 | 1 023.9 | .. | .. |
| Property rates and charges | 10.30 | 1.4 | 12.74 | 1.2 | 119.2 | .. | .. |
| All excluding housing | 632.95 | 83.9 | 783.50 | 71.9 | 116.5 | 112.7 | 114.6 |
| CPI total | 754.07 | 100.0 | 1 089.47 | 100.0 | 137.5 | 131.9 | 134.7 |
| 5. Outlays | | | | | | | |
| Housing | 141.29 | 18.2 | 205.13 | 20.7 | 110.5 | 106.5 | 108.5 |
| Utilities, repairs and maintenance | 39.83 | 5.1 | 49.57 | 5.0 | 121.4 | 121.5 | 121.4 |
| Actual rents | 53.65 | 6.9 | 71.08 | 7.2 | 114.5 | .. | .. |
| Mortgage interest charges | 37.51 | 4.8 | 71.74 | 7.3 | 90.8 | .. | .. |
| Property rates and charges | 10.30 | 1.3 | 12.74 | 1.3 | 119.2 | .. | .. |
| All excluding housing | 632.95 | 81.8 | 783.50 | 79.3 | 116.5 | 112.7 | 114.6 |
| CPI total | 774.24 | 100.0 | 988.62 | 100.0 | 115.4 | 111.3 | 113.3 |

.. not applicable
(a) Indexes (1998-99 = 100)

Source: Woolford, K (2006); An exploration of alternative treatments of owner-occupied housing in a CPI; Ottawa Group Meeting; London, May 2006.

OBSERVATIONS

14. For those measures including owner-occupied housing, in 1998-99, the expenditure aggregates vary from a low of \$754.07 (*cost-of-use*) to \$874.86 (*rental equivalence*) – a 16% difference. The relative weight for housing also varies from a low of 16.1% (*cost-of-use*) to a high of 27.7% (*rental equivalence*).

15. A similar picture emerges in 2003-04 with the exception that the weight for housing under *cost-of-use* increases to 28.1% (up from 16.1% in 1998-99).

OBSERVATIONS *continued*

16. The aggregate Laspeyres price indexes for all variants except *cost-of-use* lie within a relatively narrow band – 115.4 for *outlays* to 117.6 for *acquisitions*. The *cost-of-use* outcome of 137.5 (i.e. a 37.5% increase between 1998 and 2003) is clearly larger than the other approaches.

EVALUATION

Cost-of-use approach

17. The full *cost-of-use* approach is the least preferred approach based on the grounds that it includes asset price inflation (capital gains) which can prove problematic for consumer price index construction (i.e. potentially having negative prices). For instance, the results in Table 1 illustrate the volatility of the weight assigned to owner-occupier *cost-of-use* – growing from 2.3% to 15.8% of the CPI over five years. The weight for housing under the full *cost-of-use* approach increases significantly in times of housing booms and the volatility of this weight over time would be a concern.

Rental equivalence approach

18. The *rental equivalence* approach measures the rise and fall of house prices, indirectly through imputed rents. This approach would raise significant practical problems for construction of the CPI. The weight to be assigned to the Housing group would need to be adjusted to recognise that all owner-occupied households are paying 'imputed' rents to themselves. Crucially, this approach does not represent a consumer price facing households (i.e. based on a market transaction). This approach also results in a disproportionately large weight on Housing. Using this approach the weight for Housing in the CPI could jump from around 20% to close to 30%.

19. The ABS considers that one of the most important qualities in a price index is that it reflects actual movements in the period being recorded. As rents generally change infrequently (due to annual increases or when tenants change), one drawback of using the *rental equivalence* approach is the possibility that the CPI becomes less reliable as a measure of contemporary movements in the price level of OOH.

20. Using rents data can often lead to delayed effects of movements in the cost of housing – that is, that current movements in the CPI often tend to reflect past movements in the price of housing and that the CPI might conceivably be moving upwards when prices were in fact static or indeed falling. The US BLS experienced such situations between 1999 and 2006 where the BLS's Owners' equivalent rent (OER) index and Rent index diverged.

Outlays approach

21. The inclusion of interest charges within the *outlays* approach would make its use unacceptable in a household inflation measurement designed principally for the use of inflation targeting. Interest charges do not represent a price of goods or services.

Acquisitions approach

22. Under the *acquisitions* approach, price inflation for OOH is represented by the purchase price of new dwellings (excluding land), local government rates and charges, house repair and maintenance expenses and charges for house insurance services. In principle this extends the scope of a CPI to include household gross fixed capital formation. The treatment of OOH under the *acquisitions* approach requires the separation of the consumption and investment elements of OOH – that is, land is treated as an investment item not a consumable item.

23. The problem confronting compilers of OOH on an *acquisitions* basis is the difficulty separating the investment and consumption elements of OOH. Given the CPI is a price index for consumption goods and services consumed by households, it is important to only include the consumption element. The CPI Manual (ILO, 2004) suggests that the cost of the land be regarded as representing the investment element and the cost of the structure as representing the consumption element:

*Acquisitions approach
continued*

"The structure may deteriorate over time and hence be consumed, [however] the land remains at constant quality for all time. As the land accounts for most of the variation in observable prices for otherwise identical dwellings sold at the same point in time, the exclusion of land values may also be seen as an attempt to exclude asset price inflation from the CPI" (ILO, 2004).

24. The ABS considers that adherence to the *acquisitions* approach for OOH is appropriate considering the concept the Australian CPI is attempting to measure. The *acquisitions* approach is consistent in concept and practice with the overall purpose of the CPI. The method of pricing OOH (pricing project homes) is easily understood by users, and more importantly, it reflects actual price movements in the period being recorded.

25. There is international support for the use of the *acquisitions* approach as the main conceptual measurement construct for OOH. The Harmonized Index of Consumer Prices, which is primarily designed for comparison of prices between European countries, looked into the relative merits of the different approaches to OOH. Conceptually the *acquisitions* approach is preferred by Eurostat to construct the OOH component. As in the ABS analysis, the full *cost-of-use* approach is considered the most volatile by Eurostat (Eurostat, 2010).

26. One criticism of the use of the *acquisitions* approach to OOH in CPI statistics is that its construction does not necessarily adhere to the conventions used in compiling the National Accounts. The conceptual basis for the *acquisitions* approach to OOH begins with the premise that OOH has a dual nature – part consumable and part asset. However, National Accounts consider an owner-occupier's house to be an investment. National Accounts separate the ownership of dwellings from the household sector – creating notional transactions between households as landlords and tenants. While this provides an effective mechanism for measuring economic activity (distinguishing the value of the flow of services actually consumed by households), the distinction is considered less relevant for a measure of price inflation.

INTRODUCTION

1. The ABS has evaluated the viability of producing the CPI on a monthly basis and believes it can produce a monthly CPI measure of equivalent quality to the current quarterly measure. The monthly CPI would be constructed taking international best practice into consideration. This appendix outlines the current quarterly CPI processes, the procedures and costs for producing a monthly CPI. A comparison of selected international statistical agencies' monthly compilation procedures is also provided.

CURRENT PROCESSES

2. The current CPI is designed to measure average pure price movements over a period of time. Although it is not practical to measure all prices on this basis, the ABS adopts a number of strategies to approximate this concept across the index. Key to these strategies is the ABS practice of undertaking regular price collections throughout the quarter. Spreading the collection of prices from different outlets for particular products over the month is a practical and cost effective way of obtaining a set of prices representing the whole period. In addition, there are practical considerations which favour continuous price collection. Specifically the workload is more even, avoiding some of the operational problems associated with point-in-time collection. Pricing over most of the reference period also allows for smoothing techniques to be adopted. The general approach is to price each item as frequently as is necessary to ensure that reliable measures of quarterly price change can be calculated, resulting in a more robust CPI dataset.

3. Publishing the CPI quarterly provides sufficient time to resolve any quality change issues during the period in which they occur. Most prices are collected by personal visits to the selected outlets by trained ABS field officers, who observe actual market prices as well as discussing matters such as discounts, special offers and volume-selling items on the day with the retailers. The field officers record this information in handheld computers which facilitates interactive real time editing. Regular personal visits by field officers to the retail outlets also enable the field officers to actively monitor market developments such as market shares or possible quality changes. This information is used in maintaining the representativeness of the samples and making quality change assessments. This approach allows for two stages of price assessments. First, when field officers enter price data into their computers the figures are checked for validity. If there is a large divergence from the previous price, the field officer is asked to confirm the new price. Second, after the prices have been sent to head office they are also checked. Prices outside the upper or lower bounds for similar items are identified as outliers that require further investigation.

4. Collecting prices over the quarter is also consistent with other economic statistics, most particularly those feeding into the National Accounts.

ABS RECOMMENDATION FOR A MONTHLY CPI

5. The preferred option discussed below is expected to be achievable as it is derived from current ABS CPI procedures. The main features of the proposal are:

Definition: The ABS will maintain the current definition of the CPI (except for frequency). That is, the CPI will measure the average monthly price change of a 'basket' of goods and services which accounts for a high proportion of expenditure by the CPI population group.

Reference period: The CPI will have a reference period of one month.

ABS RECOMMENDATION FOR
A MONTHLY CPI *continued*

Price collection period: Prices will be collected over four weeks of the month. Current ABS practices will be reviewed so the present quality assurance procedures are continued and the CPI is still able to be released in a timely manner. In particular, increasing the use of transactional and administrative by-product data is being investigated to assist in meeting the volume of quality assurance work in a tight time frame.

Release timeliness: The CPI will continue to be released within one calendar month of the end of the reference period as per the IMF SDDS.

Population coverage: All private households in the capital cities. If the target population of the CPI was to change it would have an additional impact on the costs of producing a monthly CPI.

Approximate price observations: 80,000 per month. Although this is a decline of approximately 20% compared with current observations of about 100,000 per quarter, it is in line with other international statistical agencies' practices and it is expected that this will not have an adverse affect on quality. To obtain a robust figure of average price change for the month, the requirements of the CPI subgroups are taken into consideration. The drop in price observations occurs because approximately 50% of the CPI, by expenditure weight, is already collected monthly and not all of these items are deemed volatile enough to be priced more frequently than monthly.

Benefits: The full economic benefits to the Australian economy are difficult to quantify at this early stage, however at least one benefit would be more timely adjustment of the cash rate target in response to a more timely indicator of inflationary trends. A monthly CPI will comply with IMF guidelines which will assist in international comparisons. Pricing over four weeks of the month is ideal to calculate a robust measure of price change for the month. It also allows enough time for processing techniques to be employed.

Challenges: Pricing over all four weeks does create some added processing risks for the ABS. It will put more pressure on data providers and staff to adhere to tight deadlines and investigate data issues. The ABS will have to adapt current procedures to process more prices in an efficient manner.

OUTPUTS

6. The presentation of the CPI publication will be reviewed to take advantage of publishing developments, but the content is expected to remain similar to the current publication. Data for the weighted average of the eight capital cities and for each capital city will continue to be released down to the expenditure class level within one month of the end of the reference period. The index numbers as well as percentage change from the previous month and corresponding month of the previous year will be released.

7. A number of users have expressed concern about the possible absence of a quarterly index. In addition to publishing monthly and annual CPI figures, standard quarterly indexes (i.e. in respect of the March, June, September and December quarters) will continue to be published. They will be calculated as an arithmetic average of the three monthly index numbers, similar to the UK approach. This is also the current methodology for obtaining an average quarterly figure for the indexes presently compiled monthly in the CPI.

8. Some users have also expressed concern that monthly seasonality may increase the 'noise' reported in the CPI. The ABS will continue to release the *Special series* in the CPI publication. The *Special series* show the headline CPI excluding a particular group of items. This shows the effect of large, one off movements such as annual increases in electricity or education costs. The *Analytical series* will also be continued in a monthly release. Trend and seasonally adjusted estimates of the CPI are discussed in Chapter 6.

COST

9. Currently the CPI is published four times per year. Additional funding will be required to publish the CPI an additional eight times per year (i.e. twelve monthly releases). It is projected that the CPI cost will increase from approximately \$10 million to \$25 million per annum. The costs have been calculated based on the ABS preferred monthly option outlined above and are based on the assumption that the quality of the CPI is maintained and that there are no other major changes to the CPI and the current suite of ALCIs. Any additional changes such as increasing the population coverage, adopting more frequent weight updates or using scanner data will have an additional impact on the cost of the CPI.

10. These costs are in line with expectations as currently around 50% of the CPI, by expenditure weights, is collected at least monthly. The number of price observations per annum will increase from approximately 422,508 to 960,000. In the first three years of the project a one-off investment of \$6 million will be required for aspects such as redesigning and implementing a new CPI processing system and increasing sample sizes.

IMPLEMENTATION

11. A monthly CPI will be first released within two to three years of receiving funding. It is estimated that it will take one year to evaluate and improve CPI price samples, increase the number of staff and to implement computer systems. The ABS then requires at least a year to run the monthly series parallel to the current quarterly series to evaluate the quality and robustness of the index. This will also ensure that a 'percentage change from the corresponding month of the previous year' figure can be included in the first release. Assuming funding was received for 2011-12, the earliest a new monthly series would be published would be in July 2013.

INTERNATIONAL PRACTICES

12. Australia and New Zealand are the only Organisation for Economic Cooperation and Development (OECD) countries that do not publish a monthly CPI. Outlined below are some common variants on the monthly CPI used by international statistical agencies. It should be noted that practices in other countries are not necessarily considered best practice for Australia. If the ABS is to produce a monthly CPI, the quality of the index as it is currently produced, will be maintained.

TABLE 1 – CPI COMPILATION INFORMATION (a)

| | | | | | |
|--------------------------------|--|---|--|--|--|
| Country | US. | UK. | Netherlands. | Canada. | Australia. |
| Reference period | Monthly. | Monthly. | Monthly. | Monthly. | Quarterly. |
| Price collection period | 4 weeks. | 1 day. | First 3 weeks. | First 3 weeks. | First 11 weeks. |
| Definition | Measures pure price change in a market basket of goods and services of constant quality. | Average measure of change in prices of goods and services bought in the UK for the purpose of consumption by all UK households, foreign visitors and residents of institutional households. | Indication of the price increase or decrease of a basket of goods and services purchased by an average Dutch household in one year. | An indicator of the changes in consumer prices experienced by Canadians through time and obtained by comparing the cost of a fixed basket of commodities purchased in a particular year. | Pure price change in a selected basket of goods and services typically purchased by Australian households. |
| Release timeliness | Approximately 2 weeks (14-31 days) after the end of the reference period. | 2nd or 3rd Tuesday (6-20 days) following the end of the reference month. | 1st or 2nd Thursday (1-13 days) following the end of the reference month. | 16-22 working days after the end of the reference period and no later than a month. | 4th Wednesday (21-26 days) following the end of the reference period. |
| Population | All urban consumer units. | All private UK households, foreign visitors and residents of institutional households. | Covers expenditures on the Dutch territory and abroad from all Dutch resident households. | All Canadian families and individuals living in urban and rural private households. | All private households in the capital cities. |
| Coverage of the population | Prices are collected monthly for food and energy items in all cities and for all items in the three largest cities. Prices for the remaining items are collected every second month. | All of the UK. | All cities with more than 100,000 inhabitants and a sample of cities with between 10,000 and 100,000 inhabitants. Municipalities with less than 10,000 inhabitants are excluded. | Prices are collected in 15 to 76 locations based on the price behaviour of the commodity. | The eight capital cities |
| Approximate price observations | 78,500 prices from 25,500 outlets. | 120,000 prices from 20,000 outlets. | 65,000 prices from 9,000 outlets plus supermarket scanner data. | 60,000 prices from 7,000 outlets. | 100,000 prices from 10,300 outlets. |
| Other factors | Use of hedonics for quality assurances. | Point in time inflation. | Use of scanner data. | | |
| Benefits | Coverage and time to adopt smoothing techniques. | Contracts out price collections. | No regional CPI indices are published. | Time for both quality assurance and smoothing techniques. | Time for both quality assurance and smoothing techniques. |
| Drawbacks | Reliance on modelling, limited time for quality assurance. | Limited scope for smoothing techniques, logistically costly. | Not collecting prices over the entire reference period. | Not collecting prices over the entire reference period. | Reference period is not compliant to IMF guidelines. |

(a) Information obtained from the IMF SDDS website. (<http://www.imf.org/external/data.htm>)

INTRODUCTION

1. This appendix provides a summary of the methodology used to calculate the indirect fees component of the Deposit and loan facilities index and provides details of ABS analysis of some of the methodological concerns raised by users. For data confidentiality reasons, the ABS is unable to present detailed analysis. Where possible, qualitative descriptions have been provided.

SUMMARY OF CURRENT
METHODOLOGY FOR INDIRECT
FEES

2. To calculate the indirect banking service charge in the CPI, 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 products selected from each group (e.g. the sampled home loan product) are assigned a weight to represent the entire product group (e.g. housing loans). The product yield for each sampled product is determined by dividing the annualised interest by the product balance. The interest rate 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, for loan accounts it is the product yield less the reference rate). Because 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 indirect 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, such as posting effects and adjustments of various types, 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.

SUMMARY OF CURRENT
METHODOLOGY FOR INDIRECT
FEES *continued*

Table 1 - Summary of Deposit and loan methodology calculation

| | | |
|--|---|---|
| Calculate average interest rate (yield) on deposits (and loans) for each sampled institution | $Y_o = (\text{Sum of interest on all deposit products}) / (\text{Average balance on all deposit products})$ | Y_o - yield on deposits Y_l - yield on loans |
| Calculate mid-point reference rate for each sampled institution | $RR = (Y_o + Y_l) / 2$ | RR - reference rate |
| Calculate average interest rate (yield) on each product | $Y_i = I_i / B_i$ | I_i - interest on product i B_i - average balance on product i Y_i - yield on product i |
| Calculate interest rate margin on each sampled product from difference between reference rate and product yield | $M_l = Y_l - RR$ (for loans) $M_d = RR - Y_d$ (for deposits) | |
| Derive constant balance by indexing base period balance | $B^* = B_i \cdot CPI_t / CPI_o$ | CPI_t - lagged four quarter moving average of the CPI |
| Calculate dollar value of interest rate margin (price) by applying interest rate margin to indexed base period balance | $P_i = M_i \cdot B^* = M_i \cdot B_i \cdot CPI_t / CPI_o$ | |

All calculations are performed on three month moving averages of data, lagged by one month.

3. The weight of the indirect fee component of the Deposit and loan facilities index is calculated in a manner consistent with the methodology, as follows:

a) Margin and other fee calculation for sampled financial institutions, by product.

The percentage margin on each product is calculated as described above and the dollar value of the margin computed by applying the current period margin rate to the balances of the sampled accounts.

For all those products identified as being consumer products (as distinct from those used by businesses), the total receipts from households are calculated by summing the margins.

b) Scaling up to all domestic deposit-taking institutions

The aggregate ratio of these receipts to total balances for the sampled institutions is applied to aggregate balances for all deposit taking institutions to derive a national estimate i.e. scaling up sampled banks to all deposit-taking institutions. Banks, building societies and credit unions comprise the definition of deposit taking institutions.

c) Regional (state) distribution

For the regional distribution specialised state financial balance data is used.

d) Scaling down to the eight capital cities

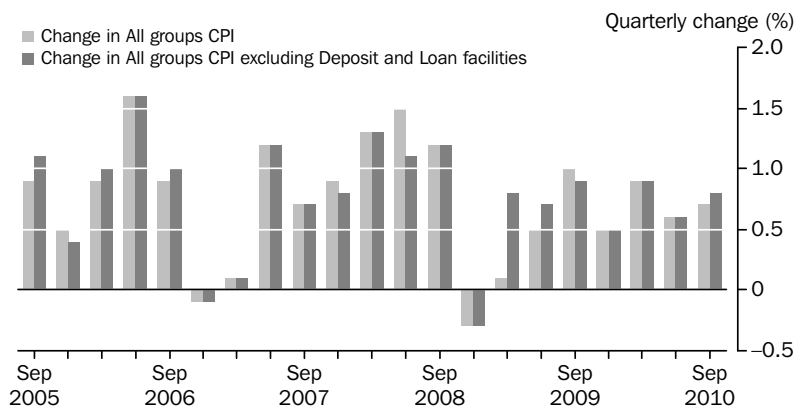
The capital city level estimates were imputed by reference to aggregate data from the household expenditure survey.

4. A fuller description of the methodology, including the methodology used to calculate the direct fees component, can be found in the Appendix (p.34-36) of the June quarter 2008 issue of the CPI or Appendix 4 of Information Paper: *Issues to be considered during the 16th series Australian Consumer Price Index (CPI) review* (cat. no. 6468.0).

IMPACT ON THE HEADLINE
CPI

5. The impact of the Deposit and loan facilities index on the All groups CPI is shown in Graph 1, which compares the published figures for changes in the All groups CPI with changes in the All groups CPI excluding Deposit and loan facilities. The largest difference is observable in the March quarter 2009.

Graph 1 - Changes in the All groups CPI and the All groups CPI excluding Deposit and loan facilities

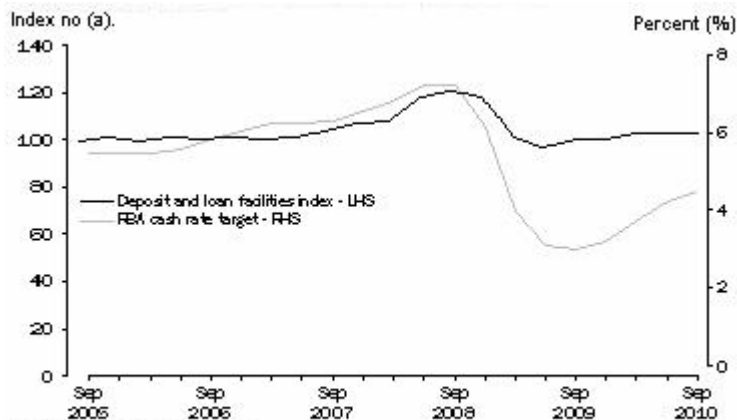


Source: ABS

VOLATILITY AND
CORRELATION WITH THE RBA
CASH RATE TARGET

6. The volatility of the Deposit and loan facilities index and its correlation with the RBA cash rate target is evident from Graph 2. Quarterly movements as large as an increase of 9.5% in the June quarter 2008 (in part the result of a correction) and a decrease of 14.1% in the March quarter 2009 have been observed. The correlation coefficient between the change in the Deposit and loan facilities index and the change in the RBA cash rate in the previous quarter is 0.9.

Graph 2 - CPI Deposit and loan facilities index and the RBA cash rate target



(a) Base: June 2005 = 100.0
Source: ABS and RBA

SENSITIVITY TO INTEREST
RATE CHANGE AND DATA
ERRORS

7. If symmetric increases of 1% are applied to all product yields, the reference rate increases by the same amount (1%) and the spread between deposit and loan yields remains constant. The interest rate increases cancel out in the calculation, leaving the percentage margins on all products unchanged. In this case, the ABS methodology delivers an index that only changes with the change in the lagged four-term moving average of the CPI (due to the indexation of base period balances).

SENSITIVITY TO INTEREST
RATE CHANGE AND DATA
ERRORS *continued*

8. If yields on loans increase more than yields on deposits, the spread between average interest rates will widen, which (in most cases) leads to an increase in the index. The margins on most products increase, leading to an increase in the index above the change in the lagged four-term moving average of the CPI. This demonstrates that, in general, the methodology will deliver an increase in the index (above the balance indexation) if yields on loans increase more than yields on deposits. This is appropriate if the spread between deposit and loan yields are widening purely as a result of bank behaviour. If however, banks are increasing loan interest rates to compensate for increasing costs of whole sale funding that are not captured by the ABS reference rate, a price increase in the indirect fees will be inappropriately reported. To take increases in costs of wholesale funding into account would involve a major change to the current model.

9. Sensitivity analysis showed that errors on products with large balances, small margins or large weights have the greatest impact on the index. This highlights the need for extremely accurate data. The impact of aggregation on the index, particularly in unstable economic times, emphasises the requirement that estimates are based on the detailed data for individual products. The differences between sampled and census indexes also imply that a more reliable index will be obtained if data is available on all products. To produce an index robust under all economic conditions the ABS is negotiating further with data providers.

TREATMENT OF FIXED RATE
PRODUCTS

10. The impact of fixed rate products on the Deposit and loan facilities index was assessed by comparing the index with one calculated by excluding fixed rate products. The two indexes showed remarkably different behaviour in times of interest rate volatility, as fixed rate product yields moved very differently from the reference rate. Alternative treatments of fixed rate products such as using a reference rate matched to the product maturity reduced both the volatility and impact on the index of fixed rate products. Treatment of fixed rate products are a subject of international debate in which the ABS is involved and it would be premature to reach a conclusion prior to consensus of the international community.

SAMPLING STRATEGY

11. The difference between sampling a single product, three dominant products, and all products within each product group (a census of products) was examined. The three sampling strategies led to minor differences in the index, which indicates that the current strategy may produce an index that is not representative of all products. To avoid these issues the ABS is aiming to produce output using a census index containing all products.

FREQUENCY OF LOWER LEVEL
WEIGHT UPDATING

12. Low level weight updating (below the expenditure class level) is common practice in the CPI. A superior result is obtained if the relative weights of product groups are updated annually. The ABS recently adopted procedures for routine annual weight updates for the Deposit and loan facilities index.

ALTERNATIVE REFERENCE
RATES

13. Some users were concerned about the use of a mid-point, reference rate. To address these concerns the index was recalculated using both the interbank rate (as recommended by the System of National Accounts) and a single mid-point reference rate for all institutions. The results were strongly dependent on the choice of reference rate. During the time period studied, the index using the interbank rate was extremely volatile compared with current practice. This is related to the relative impacts of divergence between the loan interest rates and the interbank rate. The current choice of reference rate delivers the least volatile alternative.

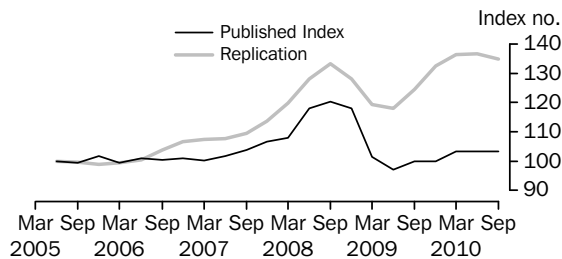
FORECASTING, INDEPENDENT
ESTIMATION, DETAIL AND
AGGREGATION

14. Graph 3 shows a comparison between the published series and the result obtained when the ABS methodology is applied to publicly available data. Average nominal (rather than transactional) interest rates are available from the RBA website by product group (although these are not split by institution). End of month balance data by financial

FORECASTING, INDEPENDENT ESTIMATION, DETAIL AND AGGREGATION *continued*

institution is available from the Australian Prudential Regulation Authority (APRA) website. These monthly data are aggregated for total household deposits and household loans are aggregated by credit cards, housing loans and other loans. The two series show both clear similarities and differences due to the reasons discussed in Chapter 4. One major source of difference is the level of aggregation.

Graph 3 - CPI Deposit and loan facilities index and replication using publicly available data



Base: June quarter 2005 = 100.0

Source: ABS, APRA, RBA

15. The CPI is a fixed basket index, i.e. the quantities are fixed in a base period and are re-priced each quarter. The current Deposit and loan facilities index methodology achieves this by repricing indirect fees on sampled products (the finest level of detail available). The publicly available data, however, is aggregated to a higher level. This caused difficulty for comparison as price changes calculated on aggregated datasets are subject to bias from compositional shift. For example, the measured average interest margin for a grouping of products that combines both home loan products and credit cards may vary from period to period depending on the relative balances on home loans and credit cards rather than any change in individual margins. If products are aggregated such that homogenous items are grouped, e.g. all home loans products, the effect may be minor. When dealing with heterogenous groups with very dissimilar prices, e.g. across product groups such as home loans and credit cards, compositional shift will be much more significant.

16. The impact of compositional change was investigated by comparing a) a completely disaggregated dataset with the same dataset in which: b) only fixed and variable rate loans were aggregated, c) data was aggregated to total household deposits and household loans was aggregated by credit cards, housing loans and other loans (as in our publicly available dataset), and d) all deposit data was aggregated as was all loan data. The differences between these series indicated that an accurate index can only be assured if data are disaggregated to the finest level of detail.

INTRODUCTION

1. This appendix describes upper level item substitution in the CPI, provides the results of ABS and Statistics New Zealand's analyses and outlines future ABS work.

ITEM SUBSTITUTION, INDEX
FORMULAE AND THE
FREQUENCY OF CPI WEIGHT
UPDATES

2. As consumer expenditure patterns change over time, a fixed set of weights used in the CPI runs the risk of becoming unrepresentative, and can lead to potential item substitution bias. Item substitution occurs when households react to changes in relative prices by choosing to reduce purchases of goods and services showing higher relative price change, and instead buy more of those showing lower relative price change.

3. Under such circumstances, a fixed-base Laspeyres index will overstate the price change of the whole basket as it is unable to take account of changes in the substitutions that consumers make in response to relative price changes. For example, were the price of beef to increase more than the price of chicken, one would expect consumers to purchase more chicken and less beef than before. As a fixed-base index would continue to price the original quantities of beef and chicken, the actual price change faced by consumers would be overstated.

4. Item substitution bias is due to changes in the pattern of household consumption which takes place over time as a result of both demand and supply changes. The longer the period between weight revision periods, the more time there is for consumers to substitute towards or away from goods and services in reaction to relative price changes, and as a result of changes in income. Similarly, supply conditions (and therefore the availability, or otherwise, of certain goods and services) can change substantially over the period in which the weights are fixed.

5. Like most CPIs, the Australian CPI is calculated using a base-weighted modified Laspeyres index formula which keeps quantities fixed between major revisions but allows prices to vary. A Laspeyres (or in most cases a Laspeyres-type) index measures the change in the cost of purchasing the same basket of goods and services in the current period as was purchased in a specified base period. The weights reflect expenditures from an historical period, the base period.

6. Laspeyres indexes are practical and easy to interpret, however they do not capture the substitution that occurs towards relatively cheaper items.

7. Superlative indexes make use of both beginning-of-period and end-of-period information on both prices and quantities (expenditures), thereby accounting for substitution across items. However, in order to construct a superlative index both price and quantity (expenditure) data are required for both periods under consideration. Given that current period expenditure data are not available on a sufficiently timely basis, a superlative formula cannot be used in the routine production of the CPI, which is why statistical agencies tend to rely on fixed baskets. Most, if not all, statistical agencies use a Laspeyres-type index (the requirement for end-of-period information in real time is the reason this type of index is an impractical option for statistical offices for the compilation of the CPI).

8. Superlative CPIs can be produced retrospectively once the required weighting data is available.

CONSTRUCTION

9. The ABS has constructed a superlative index, retrospectively, to provide an estimation of potential item (upper level) substitution bias in the fixed-weight Australian CPI, as is done by Statistics New Zealand (SNZ) following each CPI re-weight of the NZ CPI (see Statistics New Zealand, 2008).

10. Superlative indexes allow for substitution as they make use of weights for both the earlier and later periods under consideration (basically averaging across historical and current expenditures to derive a 'representative' set of weights for the period) whereas the Laspeyres index uses only base period weights. Given that current period weights are not available on a sufficiently timely basis, a superlative index cannot be used in the routine production of the CPI. However, superlative CPIs can be produced retrospectively, once the required weighting data is available.

11. Numerical estimates of item substitution bias have been made at relatively high levels of aggregation. The analysis is limited to expenditure class data as this is the lowest level for which reliable weighting information (from the HES) is available and this is the level at which the underlying quantity weights remain fixed between CPI reviews. Thus, the analysis captures substitution from one expenditure class to another, e.g. from Beef and veal to Poultry, but not within a given expenditure class, e.g. from beef to veal.

12. A superlative index has been constructed between the June quarter 2000 (start of the 14th series) and June quarter 2005 (start of the 15th series) re-weighting periods, based on national (weighted average of eight capital cities) price indexes and expenditure weights for 88 of the 90 expenditure classes. The Financial services subgroup (comprising the Deposit and loan facilities and Other financial services expenditure classes) has been excluded from the analysis as it was introduced into the CPI in 2003, between the two periods under consideration (i.e. wasn't in the 14th series). To obtain an identical basket for comparison, the 15th series weighting pattern was re-calculated excluding Financial services.

13. Using the expenditure class data, i) direct Laspeyres-type, ii) direct Paasche, and iii) direct Fisher indexes have been calculated at the All groups level. The indexes have all been calculated with the base period June quarter 2000 = 100.0. For the Paasche index, to estimate current period weights each quarter, the ABS applied a linear model between the June 2000 and June 2005 weighting patterns. Index numbers and percentage changes are presented to one decimal place, in line with the standard CPI rounding procedures.

14. Using these indexes, an estimate of potential item substitution bias in the CPI is obtained by subtracting the Fisher index from the Laspeyres index. The Fisher index is regarded as the best practical approximation of a 'true' (or 'ideal') price index, being the geometric average of the Laspeyres and Paasche indexes.

RESULTS

Table 1 - Alternative CPI indexes, June quarters 2000–2005

| Index type | QUARTER(a) | | | | | | CHANGE |
|--|------------|----------|----------|----------|----------|----------|-----------------------------------|
| | Jun-2000 | Jun-2001 | Jun-2002 | Jun-2003 | Jun-2004 | Jun-2005 | (%) Jun-2000 to Jun-2005 |
| Laspeyres | 100.0 | 106.0 | 109.0 | 112.0 | 114.7 | 117.6 | 17.6 |
| Paasche | 100.0 | 105.8 | 108.7 | 111.2 | 113.2 | 115.2 | 15.2 |
| Fisher | 100.0 | 105.9 | 108.9 | 111.6 | 114.0 | 116.4 | 16.4 |
| Laspeyres minus Fisher (potential bias) | 0.0 | 0.1 | 0.1 | 0.4 | 0.7 | 1.2 | 1.2 |

(a) Index number base: June quarter 2000 = 100.0

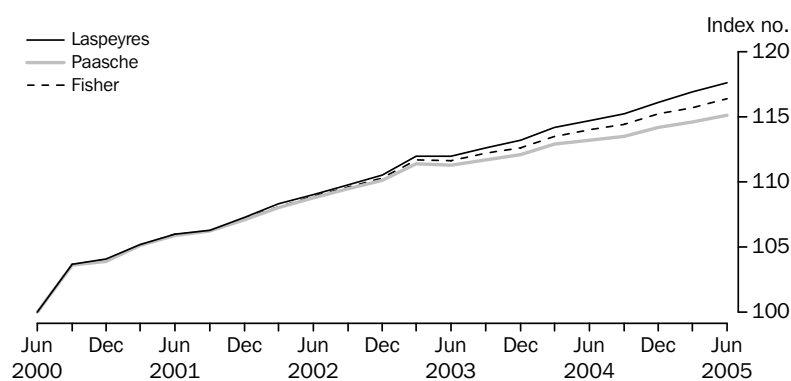
RESULTS *continued*

15. The analysis found that the All groups CPI was upwardly biased (as measured by the difference between the Laspeyres index and the Fisher index) by 1.2 percentage points at the end of the five year period due to the inability of the fixed-base index to take account of the item substitution effect. The All groups index calculated using a fixed-weight direct Laspeyres-type formula increased by a total of 17.6% over the five-year period from June quarter 2000 to June quarter 2005. The retrospective superlative index, calculated using the Fisher formula, rose by 16.4% over the same period.

16. On an annual basis this equates to an average difference of 0.2 of a percentage point per year. Thus, it can be said that the CPI for the period June quarter 2000 to June quarter 2005 is potentially upwardly biased by 0.2 of a percentage point per year due to the inability to take account of the upper level item substitution effect.

17. These results are consistent with studies by other national statistical agencies.

Graph 1 - Potential upper level item substitution bias in the All groups CPI (indicated by the difference between the Laspeyres and Fisher indexes)



Base: June 2000 = 100.0

Source: ABS

18. The results show that the longer the period between re-weights, the larger the potential upper level item substitution bias effect on the index. Table 1 and Graph 1 above illustrate the cumulative nature of the potential bias.

19. The ABS analysis estimates the annual potential item substitution bias following the second year (i.e. holding the basket constant for two years) to be 0.1 of a percentage point, whereas the period between the fourth and fifth years (i.e. holding the basket constant for five years) has an estimated potential annual bias of 0.5 of a percentage point. This finding is consistent with the SNZ analysis which shows that item substitution bias is considerably greater when NZ CPI weights are updated at six-yearly rather than three-yearly intervals (see below).

20. While there are five main sources of bias in CPIs, this analysis focuses on one type only – upper level item substitution bias – and therefore the results in the analysis should not be taken to equate to the total bias in the CPI, which will be the net sum of all sources of bias. It should also be noted that a new tax system was introduced in Australia during the analysis period, principally the inclusion of the goods and services tax (GST). It is not known whether this has impacted upon the results of the analysis.

SNZ ANALYSES

21. SNZ compiled Laspeyres and retrospective superlative index time series for four scenarios—between June quarter 2002, June quarter 2006 and June quarter 2008—that cover different combinations of the frequency of weight updates and the level in the hierarchical CPI structure of weight updates. Generally, the results show that item substitution bias in the fixed-base New Zealand CPI grows over time during the period in

SNZ ANALYSES *continued*

which weights are fixed, and that the lower the level at which the weights are fixed (i.e. if lower-level weights are not updated between revision periods), the larger the bias.

22. Of particular interest, given that the Australian CPI is currently re-weighted every six years, SNZ demonstrated how the New Zealand CPI might have tracked had a scheduled (2006) re-weight not occurred (by holding the 2002 weights fixed at the class level for the period June quarter 2002 to June quarter 2008). The analyses show that employing fixed weights for six years would have resulted in an annual average increase of 3.2% in the New Zealand All groups CPI for the period June quarter 2006 to June quarter 2008, compared with an annual average increase of 3.0% for the same period under the current SNZ practice of three-yearly weight updates.

FUTURE WORK

23. The ABS will finalise the 16th series weighting pattern in October 2011. The ABS will then be in a position to extend its analyses and construct a retrospective superlative index for the period June 2005 to June 2011, providing an estimate of the bias in the CPI due to the current six-yearly weight update cycle, and producing a retrospective superlative index time series from June 2000 to June 2011.

INTRODUCTION

1. This appendix contains information and examples of where greater alignment between classifications (or creating and improving correspondences) may improve statistical coherence.
2. The ABS considered numerous criteria to assess the most appropriate classification for use in the CPI. The classification should: align with Australian CPI concepts; represent the economic reality faced by Australian households; and facilitate both international comparisons of CPIs and internal coherence with other ABS statistics.

ALIGNMENT WITH AUSTRALIAN CPI CONCEPTS

3. The Consumer Price Index Commodity Classification (CPICC) facilitates a CPI based on the *acquisitions* approach whose principal purpose is to measure household sector inflation. The Classification of Individual Consumption According to Purpose (COICOP) facilitates a CPI based on an economic *cost-of-use* approach which is more closely aligned to a CPI that measures household standard of living.
4. CPICC is a demand-based classification which is based on the concept of household utility. It groups items together which are substitutable. COICOP groups products together which are deemed to fulfil particular purposes.
5. One of the major differences between the two classification concepts is the treatment of owner-occupied housing (OOH) in the CPI. The COICOP treatment is for OOH to be measured by imputed rent. In the *acquisitions* based CPICC housing is measured as newly constructed owner-occupied houses.
6. There are a number of areas where the ABS prefers to depart somewhat from COICOP in order to be more representative of the Australian context. One example is the inclusion of bicycles in transport under COICOP. In the Australian context, bicycles are judged to be more appropriately classified to recreation.
7. Despite these conceptual differences the two classifications are broadly similar at the top level.
8. The differences arising here are considered slight, and would not have a significant impact at the higher levels of CPI. However, having an ABS CPI purpose designed classification allows the ABS to be more representative of, and more responsive to, changes in the Australian households' experiences.

INTERNATIONAL COMPARISON

9. Using a COICOP-based classification may have the advantage of being broadly internationally comparable at the top level.
10. However very few, if any, countries use the standard COICOP structure. The majority of agencies that do have structures based on COICOP manipulate the structure to be more relevant to their domestic circumstances. For example, the Eurostat Harmonised Index of Consumer Prices excludes housing all together, while other countries such as the USA use classifications and structures designed solely to meet their domestic needs.
11. The CPICC is internationally comparable to classifications used in other countries' CPIs. It is conceptually different to the COICOP but there is a broad correlation which facilitates international comparisons.

INTERNAL COHERENCE

12. The ABS generally advocates that classifications ensure comparability and coherence across economic statistics, although not at the risk of undermining the primary purpose for which the component statistics are compiled. Although the CPICC aligns best with the underlying concepts of the Australian CPI there are other ABS statistics that utilise COICOP or a variant of COICOP for household expenditure classification.

Household Expenditure Survey (HES): This survey is used to update the CPI weights during reviews and would not benefit from CPI adopting COICOP. The HES uses the Household Expenditure Classification (HEC) for internal and published analysis, however the survey is also released in a standard System of National Accounts (SNA) COICOP structure for international analysis.

Household Final Consumption Expenditure (HFCE): This data set is compiled as part of the Australian System of National Accounts (ASNA). It is classified on a COICOP basis modified for the Australian economy, i.e. ASNA COICOP is deemed to be more appropriate in this series due to the different basis of the accounts (economic *cost-of-use*). Because of these amendments to the structure, the ASNA COICOP structure differs from COICOP used for the HES.

Input-Output (I-O) tables: The ASNA also use the Input-Output product classification (IOPC) to structure the Input-Output (I-O) tables. The I-O tables use CPI data for deflation purposes. Because the I-O system describes the production and subsequent use of all goods and services, the classification is defined in terms of characteristic products of the industry sectors. A direct correspondence between CPICC and IOPC has not yet been developed. However, a correspondence was developed between the detailed Household Expenditure Classification (HEC) and the IOPC, and an indirect correspondence between the CPICC and IOPC could be readily developed if required.

GLOSSARY

| | |
|---|---|
| Acquisitions approach | A conceptual approach to constructing the CPI. It measures changes in the prices of goods and services acquired. |
| All groups index | The index series showing price movement for the weighted combination of all goods and services priced for the CPI. The highest level of CPI aggregation. |
| Analytical living cost indexes (ALCIs) | A suite of indexes specifically designed to measure changes in living costs across different groups in the community. These subgroups are: Employee households; Other government transfer recipient households; Age pensioner households; and Self-funded retiree households. |
| Basket | Commonly used term for the goods and services priced for the purpose of compiling the CPI. |
| Bias | A systematic tendency for the calculated CPI to diverge from some ideal or preferred index, resulting from the method of data collection or processing, or the index formula used. Classification |
| COICOP | Classification of Individual Consumption According to Purpose - the international standard classification framework for the systematic categorisation of all goods and services acquired by the consumer household sector. |
| Compilation | The process of deriving price indexes for elementary aggregates. |
| Cost of living index | An index that Pollack (1983) defined as measuring the change over time in the minimum cost of purchasing a basket of goods and services capable of providing the same utility (or satisfaction) as that provided by the basket purchased in the reference base period. |
| Cost-of-use approach | A conceptual approach to constructing the CPI. The <i>cost-of-use</i> approach provides the best indication of changes in living standards as it relates to goods and services actually consumed in the base period, irrespective of when they were acquired or paid for. |
| CPI | Consumer Price Index - a general indicator of the rate of change in prices paid by households for consumer goods and services. |
| CPI population group | That subset of the Australian population to which the CPI specifically relates, currently metropolitan households. |
| CPI Series review | The Consumer Price Index (CPI) is subject to periodic reviews. While an important objective of the reviews is to update item weights, formal reviews also provide an opportunity to reassess the scope and coverage of the index and other methodological issues. |
| Deposit and loan facilities | Services of deposit and loan facilities provided by financial intermediaries. These measures are a significant component of the Financial Services index. |
| Elementary aggregate | Elementary aggregates represent the lowest level for which indexes are constructed. In concept, they also represent the finest level at which commodity weights can be assigned. There are up to 1,000 elementary aggregates for each capital city. |

| | |
|--|---|
| Expenditure class | A grouping of like items in the CPI regimen; this is the level at which CPI weights remain fixed during the life of each CPI series. There are 90 expenditure classes. |
| Fisher price index | The geometric average of the Laspeyres price index and the Paasche price index. It is a symmetric index and a superlative index. |
| Fixed weighted index | An index in which the weighting pattern is fixed for the period for which the index is calculated. |
| Group | The first level of disaggregation of the CPI. There are 11 expenditure groups in the CPI. |
| Household Expenditure Survey (HES) | A sample survey conducted to determine the expenditure patterns of private households. Data from the HES is used as a primary source of information for the estimation of expenditure weights in the CPI. |
| Indexation | The periodic adjustment of a money value (e.g. pensions, rents) according to changes in a selected index. |
| Laspeyres price index | A basket index in which the basket is composed of the actual quantities of goods and services in the earlier of the two periods compared. |
| Linking | The technique used to join index series which have different weighting patterns to form a continuous series. The technique ensures that the resultant linked index reflects only price variations (i.e. the introduction of new items and weights does not itself affect the level of the index). Also referred to as chaining. |
| Metropolitan | For purposes of the CPI 'metropolitan' refers to the six State capital cities, Darwin and Canberra. |
| Outlays approach | A conceptual approach to constructing the CPI. The outlays (or payments) approach defines the basket in terms of the actual amounts paid by households during the base period to gain access to consumer goods and services (without regard to the source of such funds). |
| Owner-occupied housing (OOH) | Dwellings owned by the households that live in them. The dwellings are fixed assets that their owners use to produce housing services for their own consumption, these services being usually included within the scope of the CPI. |
| Paasche price index | A basket index in which the basket is composed of the actual quantities of goods and services in the later of the two periods compared. |
| Pensioner and Beneficiary Living Cost Index (PBLCI) | An index established in August 2009 that specifically reflects changes in the living costs of pensioners and other households receiving income support from the government. |
| Price index | A composite measure of the prices of items expressed relative to a defined base period. |
| Price levels | Actual money values at a particular time. |
| Price movements | Changes in price levels between two or more periods. Movements can be expressed in money values, as price relatives, or as percentage changes. |
| Price relative | A measure of price movements: the ratio of the price level in one period to the price level in another. |
| Property income | The income receivable by the owner of a financial asset or a tangible non-produced asset in return for providing funds to, or putting the tangible non-produced asset at the disposal of, another institutional unit. |

| | |
|----------------------------------|---|
| Pure price change | The change in the price of an item after removing any variation in price attributable to a change in quality or quantity. |
| Quality adjustment | The elimination of the effect that changes in the attributes (quality) of an item have on the price of an item in order to isolate the pure price change. |
| Reference base period | The period in which the CPI is given a value of 100.0. The CPI is currently on a reference base of 1989-90. |
| Rental equivalence | The estimation of the imputed rents payable by owner-occupiers on the basis of the rents payable on the market for accommodation of the same type. |
| Scanner data | Detailed data on sales of consumer goods obtained by scanning the bar codes for individual products at electronic points of sale in retail outlets. The data can provide detailed information about quantities, characteristics and values of goods sold, as well as their prices. |
| Spatial price index (SPI) | A spatial price index is one that enables price levels to be compared between geographical regions at the same time. |
| Subgroup | A collection of related expenditure classes. There are 33 subgroups in the CPI. |
| Superlative index | A superlative index is one of a small group of indexes that makes equal use of prices and quantities, and treats them in a symmetrical manner in each pair of periods under observation. Examples are the Fisher Index and the Tornqvist Index. Superlative indexes require both price and expenditure values for all periods. |
| Temporal price index | A temporal index is one that allows for comparison between sets of prices at two times. |
| User cost | The cost incurred over a period of time by the owner of a fixed asset or consumer durable as a consequence of using it to provide a flow of capital or consumption services. User cost consists mainly of the depreciation of the asset or durable (measured at current prices and not at historic cost) plus the capital, or interest, cost. |
| Weight | The measure of the relative importance of an item in an index regimen. Weights can be expressed in either quantity or value terms. Value weights are used in the CPI. |
| Weighting base period | The period to which the fixed expenditure weights relate. |

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