



Information Paper

**Introduction of the 17th
Series Australian
Consumer Price Index**

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PREFACE

The purpose of this information paper is to describe the changes that will be made to the Consumer Price Index (CPI) and Selected Living Cost Indexes (SLCIs) as a result of the introduction of the 17th series expenditure patterns. The first publications based on the 17th series will be in respect of the December quarter 2017, which are due to be released on 31 January 2018 (CPI) and 7 February 2018 (SLCIs).

Australia has produced indexes of retail price inflation going back as far as 1901. Prior to the introduction of the CPI in 1960, there were five series of retail price indexes compiled by the (then) Commonwealth Bureau of Census and Statistics. Since 1960, the Australian Bureau of Statistics (ABS) has maintained a program of periodic reviews of the CPI to ensure that it continues to meet community needs. The main objective of these reviews is to update the household expenditure information used to set the item weights in the CPI, but they also provide an opportunity to reassess the scope and coverage of the index.

The SLCIs, incorporating the Pensioner and Beneficiary Living Cost Index (PBLCI) and the Analytical Living Cost Indexes (ALCIs) have also been reviewed as part of the 17th series. These indexes are produced as a by-product of the CPI, with weights also derived from the Household Expenditure Survey (HES).

The 17th series review is a minor review of the CPI and SLCIs, consisting of an update of the upper level (expenditure class) weights in line with the latest HES, and a simple examination of structures and methodologies.

This information paper provides an overview of the changes to the CPI and SLCIs that will be introduced with the 17th series from the December quarter 2017. It describes the household expenditure data used to calculate the weights and the ways in which some of the data have been adjusted to align with CPI and SLCI requirements. The paper also presents the updated weighting patterns and some background on the major shifts in weights between the 16th and 17th series. There are no changes to the classification structure or publications in respect of the 17th series.

The ABS will release an updated *A Guide to the Consumer Price Index: 17th Series* (cat. no. 6440.0) in conjunction with the release of the 17th series CPI on 31 January 2018. The *Consumer Price Index: Concepts, Sources and Methods* (cat. no. 6461.0) will also be updated to reflect the changes made during the 17th series review. The updated version is expected to be released in February 2018.

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ALCI	Analytical Living Cost Index
APRA	Australian Prudential Regulation Authority
ASGC	Australian Standard Geographical Classification
ASGS	Australian Statistical Geography Standard
AWE	Average Weekly Expenditure
COICOP	Classification of Individual Consumption According to Purpose
CPI	Consumer Price Index
CPICC	Consumer Price Index Commodity Classification
CTP	Compulsory Third Party
EC	Expenditure Class
FISIM	Financial Intermediation Services Indirectly Measured
GCCSA	Greater Capital City Statistical Area
GFCF	Gross Fixed Capital Formation
HEC	Household Expenditure Classification
HELP	Higher Education Loan Program
HES	Household Expenditure Survey
HFCE	Household Final Consumption Expenditure
ISC	Insurance Service Charge
n.e.c.	not elsewhere classified
NSO	National Statistical Office
PBLCI	Pensioner and Beneficiary Living Cost Index
PP	Percentage Point
SLCI	Selected Living Cost Index

CHAPTER 1: BACKGROUND

1.1 The ABS first compiled the CPI in 1960 with a time series extending back to the September quarter 1948. Prior to introducing the CPI, the ABS and its predecessor agency, the Commonwealth Bureau of Census and Statistics, produced a number of discrete retail price indexes, each constructed with fixed quantity weights and spanning different lengths of time from 1901 to 1960 – see Chapter 3: Historical Background of *Consumer Price Index: Concepts, Sources and Methods* (cat. no. 6461.0) for more detail. The introduction of the CPI heralded a different approach to constructing price indexes. Rather than compiling a set of discrete fixed-weighted indexes, the objective became to produce a series of short-term fixed-weighted indexes that were to be regularly linked together to provide a single continuous measure of price change. This strategy was adopted to ensure that, at any point in time, the weighting patterns and item coverage of the CPI were relevant to user requirements and reflected contemporary economic conditions. As a result, the ABS has maintained a program of periodic reviews of the CPI to ensure that it continues to meet community needs.

1.2 The ABS also publishes the Analytical Living Cost Indexes (ALCIs) and the Pensioner and Beneficiary Living Cost Index (PBLCI), collectively known as the Selected Living Cost Indexes (SLCIs, cat. no. 6467.0). The ALCIs have been compiled and published since June 2000 and were developed in recognition of the widespread interest in the extent to which the impact of price change varies across different groups of households in the Australian population. The PBLCI was introduced in the June quarter 2009 and is a measure of the effect of changes in prices experienced by Age pensioner and Other government transfer recipient households. These indexes are also evaluated as part of the periodic review program.

1.3 The most important objective of these reviews is to update the CPI and SLCI weighting patterns, which represent the average expenditure of Australian households on goods and services. When analysing a new set of weights compared with the previous set, it is important to note that the weights are relative to each other rather than being absolute. As a result, the weight of a product could fall, for example, even though the expenditure per household on the product has increased over time. This occurs when the increase is less than the average increase for all products. Products in the CPI and SLCIs include both goods and services purchased by households.

1.4 The ABS classifies these reviews as either 'major' or 'minor' depending on the issues being considered during a particular review. In general, a minor review is restricted mainly to updating the weighting patterns. As well as updating the weights, a major review involves examining the structure and purpose of the CPI and SLCIs, their underlying classification and commodity coverage. The 17th series review is a minor review.

1.5 This information paper details the new weighting patterns, as well as discussing the key enhancements in the 17th series and providing an overview of data sources and methodologies used in deriving the weights. The paper also provides an updated estimate of the amount of upper level substitution bias in the Australian CPI. There will be no changes to the classification structure or publications in respect of the 17th series.

1.6 Associated with this information paper are two data cubes available on the ABS website: *Consumer Price Index: 17th Series Weighting Pattern* (cat. no. 6473.0), which contains the 17th series CPI weights, points contributions and average weekly expenditures; and *Selected Living Cost Indexes: 17th Series Weighting Pattern* (cat. no. 6474.0), which contains the 17th series weights and average weekly expenditures for the four household types: Employee, Age pensioner, Other government transfer recipient, and Self-funded retiree. It also contains the 17th series weights and average weekly expenditures for the Pensioner and Beneficiary Living Cost Index, which combines the Age pensioner and Other government transfer recipient households.

1.7 The 17th series CPI and SLCI weights will be implemented in the December quarter 2017, due to be released on 31 January 2018 and 7 February 2018 respectively.

SUMMARY

2.1 The 17th series CPI and SLCIs include a number of enhancements which will be incorporated from the December quarter 2017. These enhancements will improve the quality of the indexes and better position the ABS for the annual re-weighting of the CPI using National Accounts Household Final Consumption Expenditure (HFCE) data from December quarter 2018. The 17th series CPI will be linked to previous CPI series, providing a continuous measure of price change since 1948. The All groups CPI (headline measure) will not be revised. The enhancements are:

- updated CPI and SLCI expenditure class (EC) weights derived from the 2015-16 Household Expenditure Survey (HES) and other data sources;
- updated geographical coverage to the Australian Statistical Geography Standard (ASGS) 2011;
- changes to data sources and methodologies in deriving weights for the following ECs in the CPI: New dwelling purchase by owner-occupiers, Insurance, and Other financial services;
- updated expenditure estimates used to derive the weights for the Self-funded retirees sub-group in the SLCIs; and
- changes to the method used to estimate the upper level substitution bias in the Australian CPI.

2.2 A summary of the main changes is provided below. More detailed information can be found in later chapters of this information paper.

2.3 From 2018, the CPI will be re-weighted annually in December quarters. Further information on the forthcoming annual re-weighting can be found in *Chapter 6: Upcoming work*.

2.4 Additionally, as noted in *Information Paper: An Implementation Plan to Annually Re-weight the Australian CPI* (cat. no. 6401.0.60.005), the ABS has documented a method to calculate EC contributions to percentage change with annually re-weighted indexes. Empirical analysis of this approach can be found in Appendix 3.

2.5 The 16th series CPI review resulted in a number of outcomes which required further investigation. These are detailed in *Outcome of the 16th Series Australian Consumer Price Index Review* (cat. no. 6469.0). Appendix 4 provides an update on these outcomes.

UPDATED GEOGRAPHICAL COVERAGE TO THE AUSTRALIAN STATISTICAL GEOGRAPHY STANDARD (ASGS) 2011

2.6 The geographical coverage of the CPI and SLCIs is predominantly based on the capital city average household expenditure data obtained from the HES. The 16th series was derived from the 2009-10 HES capital city Statistical Divisions, which were collected based on the Australian Standard Geographical Classification (ASGC).

2.7 In line with the 2015-16 HES, the geographical coverage of the CPI and SLCIs has been updated to the Australian Statistical Geography Standard (ASGS) 2011 for the 17th series, with the capital cities defined by Greater Capital City Statistical Areas (GCCSAs). For more information, refer to *Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas, July 2011* (cat. no. 1270.0.55.001).

2.8 The change from Statistical Divisions to GCCSAs has resulted in an expansion of the capital city boundaries for Melbourne, Brisbane, Adelaide and Perth. This is also the case for Canberra, however the actual difference in population is minimal. The definitions of Sydney and Darwin have remained largely unchanged. The impact of these boundary changes on price collection is being addressed through the CPI's regular sample maintenance and review program.

CHANGES TO DATA SOURCES AND METHODOLOGIES IN DERIVING THE CPI WEIGHTS

New dwelling purchase by owner-occupiers

2.9 In the CPI, New dwelling purchase by owner-occupiers refers to the expenditure on net additions of household sector dwellings as a measure of owner-occupier housing costs, and includes new homes (excluding land) and major improvements. Specifically, expenditure on New dwelling purchase by owner-occupiers comprises of four components: owner-occupied housing, first home owners' grants, alterations and additions, and installed appliances.

2.10 Previously, estimates of net additions to the owner-occupier dwelling stock were derived from Census data on the number of owner-occupier households, moved forward by household projections from *Household and Family Projections, Australia* (cat. no. 3236.0). For the 17th series, National Accounts estimates of the stock of owner-occupied dwellings have been used. These estimates are benchmarked to the Census.

2.11 The data sources for expenditure on the alterations and additions and installed appliances components have also changed in the 17th series. These estimates were previously obtained from the HES. For the 17th series, National Accounts estimates have been used in deriving the weights. The data source for alterations and additions is the National Accounts alterations and additions component of Private gross fixed capital formation (GFCF), while expenditure on installed appliances is sourced from HFCE data.

Insurance

2.12 The weights for Insurance in the CPI should reflect the service provided by insurers to the household sector in aggregate. This is represented by the difference between the premiums paid and the claims received, otherwise known as the insurance service charge (ISC). This differs from the expenditure reported in the HES, which are the gross premiums paid by households.

2.13 In previous series reviews, adjustments were made to the HES data for CPI weighting purposes, using data obtained from the Australian Prudential Regulation Authority (APRA) and insurance companies.

2.14 For the 17th series, the weight for Insurance in the CPI has been derived using National Accounts estimates of the insurance service charge, which align conceptually with the CPI. This will also be the data source used when the CPI is annually re-weighted.

Other financial services

2.15 Other financial services include real estate agent services, legal and conveyancing services, stockbroking services and taxes on property transfers (i.e. stamp duty).

2.16 In past series reviews, expenditure on real estate agent services was derived from property transaction data and unpublished ABS survey data on real estate agents' fees. From the 17th series, the real estate fees component of the National Accounts Private GFCF ownership transfer costs series has been used.

CHAPTER 2: ENHANCEMENTS IMPLEMENTED IN THE 17TH SERIES CPI AND SLCIS

2.17 The data sources for the remaining components of Other financial services have remained unchanged from the 16th series.

EXPENDITURE ESTIMATES USED TO DERIVE THE WEIGHTS FOR THE SELF-FUNDED RETIREES SUB-GROUP IN THE SLCIS

2.18 The SLCIs are produced as a by-product of the CPI, with weights also derived from the HES. As a result, use of HES expenditures at the capital city level is preferred for the SLCIs, as it aligns the weighting and price collection scope of the two sets of indexes.

2.19 For the 16th series, the expenditure weights for the SLCIs were calculated using 2009-10 HES weighted average of eight capital cities expenditures for all population sub-groups except Self-funded retirees. The weights for Self-funded retiree households were derived using national expenditures, due to high relative standard errors (RSEs) in the capital city estimates.

2.20 For the 17th series, the weighted average of eight capital cities expenditure estimates have been used for all population sub-groups. An analysis of the 2015-16 HES results has shown that expenditure weights at the capital city level are sufficiently reliable for all household types.

ESTIMATING THE UPPER LEVEL SUBSTITUTION BIAS IN THE AUSTRALIAN CPI

2.21 In order to provide an estimate of the potential item (upper level) substitution bias in the fixed-weight Australian CPI, the ABS constructs a retrospective superlative index during series reviews. This analysis can only currently be conducted retrospectively when the HES data is available.

2.22 Superlative indexes allow for product substitution as they make use of weights for both the earlier and later periods under consideration, whereas the Laspeyres index uses only base period weights.

2.23 Under the previous approach of estimating substitution bias, a quarterly superlative index was derived using the published, price updated weights. For the 17th series, the ABS has improved the estimation of the superlative index to better reflect true inflation. This index is now derived on a financial year basis, using the original weights from the HES and financial year estimates of price change. This new approach is preferred as it ensures consistency with the original period of the weights.

2.24 Updated estimates of substitution bias for the 1998-99 to 2015-16 period are available from *Chapter 5: Estimating the upper level substitution bias in the Australian CPI*.

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

3.1 A comprehensive description of the CPI methodology is outlined in *Consumer Price Index: Concepts, Sources and Methods* (cat. no. 6461.0). This will be updated to reflect the changes in the 17th series CPI and is scheduled for release in February 2018.

3.2 The 17th series CPI, consistent with the 13th, 14th, 15th and 16th series, has been designed as a general measure of price inflation for the household sector. The CPI measures changes in the price of a fixed quantity of goods and services acquired by consumers in metropolitan private households.

3.3 The SLCIs measure the impact of changes in prices on the out-of-pocket expenses incurred by households to gain access to a fixed quantity of consumer goods and services. They have been compiled and published since June 2000 and are prepared for four types of Australian households:

- Employee households (i.e. those households whose principal source of income is from wages and salaries);
- Age pensioner households (i.e. those households whose principal source of income is the age pension or veterans affairs pension);
- Other government transfer recipient households (i.e. those households whose principal source of income is a government pension or benefit other than the age pension or veterans affairs pension); and
- Self-funded retiree households (i.e. those households whose principal source of income is superannuation or property income and where the HES defined reference person is 'retired' (not in the labour force and over 55 years of age)).

3.4 The PBLCI was added to the suite of living cost indexes in the June quarter 2009 and combines the Age pensioner and Other government transfer recipient households. Unlike the CPI, the SLCIs are compiled on an outlays basis.

3.5 There are three areas of expenditure in which the CPI and the SLCIs differ. These are:

- Purchase of dwellings
 - Under the acquisitions approach used in the CPI, the net purchase of housing, the increase in volume of housing due to renovations and extensions, plus other costs (e.g. maintenance costs and council rates) are all included for owner-occupied households. Of note, land is excluded from the calculation of housing in the Australian CPI as it is considered an investment rather than consumption. This approach aligns with international statistical standards and the primary purpose of the CPI as a macro-economic indicator. Changes in rental are measured for that part of the population that resides in rented dwellings. The CPI excludes interest paid on mortgages.
 - Under the outlays approach used in the SLCIs, the changes in the amount of interest paid on mortgages (measured as part of Insurance and financial services) and other costs (e.g. maintenance costs and council rates) are included for owner-occupied housing. In addition, changes in rental are measured for that part of the reference population that resides in rented dwellings.
- Insurance (other than health insurance)
 - Under the acquisitions approach, the weight for insurance in the CPI relates to the net value of the service provided by the insurance company to the household sector as a whole. In simple terms, this is the amount of premiums paid by households, less the amounts reimbursed by way of claims.
 - Under the outlays approach used for the SLCIs, the weight relates to the gross value of insurance premiums paid by households.

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

- Financial services
 - The CPI includes services relating to the acquisition, holding and disposal of financial and real assets. This includes deposit and loan facilities provided by financial institutions and costs associated with the acquisition and disposal of real estate, such as stamp duty and real estate commission fees.
 - The SLCIs include mortgage interest and consumer credit charges, but exclude all other financial services (i.e. deposit and loan facilities (direct charges), and other financial services).

3.6 In determining the composition of the CPI and SLCI baskets (and item weights), the objective is to reflect the contemporary experiences of households. The starting point for compiling the weights is the results of the ABS 2015-16 HES. The HES obtained information on the spending habits of Australian households throughout the 2015-16 financial year.

2015-16 HES DATA

3.7 The 2015-16 HES collected information from a sample of 10,046 households over the period July 2015 to June 2016. Data was collected using a diary of personal expenditures in which usual residents aged 15 years and over record their expenditure over a two week period. A household level computer assisted interview questionnaire also collected information on household characteristics, expenditures common to all household members (e.g. utility bills) and irregular or infrequent expenditures. The recall period for the irregular or infrequent expenditures varied: 3 months including furniture and house repairs; last payment including general rates, electricity and health services; and the last 12 months including motor vehicle purchase, motor vehicle repair and maintenance, education, overseas holiday travel and house alterations and additions. See *Household Expenditure Survey, Australia: Summary of Results, 2015-16* (cat. no. 6530.0) for more information on the HES.

3.8 The 2015-16 HES was collected under the Australian Statistical Geography Standard (ASGS) introduced in 2011. This is a change from the Australian Standard Geographical Classification (ASGC) used for the 2009-10 HES. The ASGS provides a common framework of statistical geography used by the ABS to enable the publication of statistics that are comparable.

3.9 The detailed HES expenditure items are classified according to the ABS Household Expenditure Classification (HEC). A correspondence exists between the CPI and HEC. Most HEC codes have a direct correspondence to one CPI expenditure class. Where a one-to-one correspondence could not be established due to the broad nature of a HEC code or insufficient information being provided by households, splits were determined either on a prorate basis, using industry data or subjectively across appropriate expenditure classes. In most cases where splits were required, the expenditures involved were relatively small. The CPI to HEC correspondence will be published as a data cube in *Consumer Price Index: Correspondence with 2015-16 Household Expenditure Classification, Australia* (cat. no. 6446.0.55.001) with the implementation of the 17th series CPI on 31 January 2018.

3.10 The CPI to HEC correspondence was applied to the HES data to derive household average weekly expenditure for 2015-16 at the expenditure class level. The average weekly expenditure was used to analyse both the 2015-16 expenditure and the changes since the 2009-10 HES.

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

3.11 Although the HES provides a comprehensive coverage of household expenditure, various adjustments are made to the HES average weekly expenditures for use in the CPI and SLCIs. In most cases the adjustments to expenditure were made without compensating adjustments to other expenditure in the CPI and SLCI baskets. The implication is that changes in such expenditure were assumed to have come from, or gone into savings.

3.12 For the 17th series, National Accounts data has been used to derive expenditure for some of the CPI ECs, representing a change from the data sources used previously. These changes result in consistency with the data sources to be used under annual re-weighting of the CPI from December quarter 2018, and were brought forward to better position the CPI for this shift. These changes have been earlier communicated by the ABS in *Information Paper: Increasing the Frequency of CPI Expenditure Class Weight Updates* (cat. no. 6401.0.60.002).

ADJUSTMENTS TO HES DATA

Under-reporting of alcohol and tobacco expenditures in the HES

3.13 Historically, HES expenditure on alcohol and tobacco is under-reported when compared to information from other sources. As a result, HES estimates are adjusted for under-reporting based on factors derived at the national level using National Accounts HFCE data. These factors are applied to the HES expenditure estimates for each capital city. The 2015-16 HES estimated expenditure for alcohol at a little under half, and tobacco at a little over one third of the respective National Accounts estimates.

3.14 As households do not always separately identify alcohol and meal expenditures when reporting expenditure on restaurant meals in the HES, a small adjustment is made using the proportion of reported meal expenditure that is alcohol, estimated from an analysis of HES unit records. Meal expenditure is reduced by the proportion of reported meal expenditure that is alcohol, with the difference then included in expenditure on alcohol. This adjustment does not impact overall household expenditure.

Audio, visual and computing equipment

3.15 The 2015-16 HES data provided the latest information on household expenditure on Audio, visual and computing equipment which was then price updated to the September quarter 2017. However, for Audio, visual and computing equipment this approach may lead to underestimation of the weight in the CPI and SLCIs due to the relatively high volume growth in the quality (size and features) of these high technology goods compared to other products. Therefore, a volume increase of around 12% has been calculated from the National Accounts HFCE components between 2015-16 and September quarter 2017.

Recall adjustment

3.16 As noted in paragraph 3.7, some expenditures are collected in the HES as recalled items rather than diary entries. To the extent that prices for these items change between the time the household purchased them and their inclusion in the HES, expenditures will not accurately reflect the underlying quantities acquired during the HES reference year.

3.17 To address this, adjustments are made for items where the recall period is the last twelve months, such as education and overseas holiday travel. No adjustments are made for items where the recall period is the last three months, since these adjustments would be small. Additionally, no adjustment is made for items where the recall period is the last payment, as these typically have a short billing cycle (often quarterly), or options to pay periodically (e.g. local government rates).

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

3.18 For information on how recall adjustments are calculated, refer to paragraphs 6.18 and 6.19 of *Consumer Price Index: Concepts, Sources and Methods, 2016* (cat. no. 6461.0).

Salary sacrifice

3.19 Salary sacrifice is an arrangement between an employee and employer whereby part of the employee's pre-tax cash salary is traded for non-cash benefits. Conceptually, these arrangements should be captured in both gross wages and salaries, and household expenditure.

3.20 The items that have been adjusted for salary sacrifice include motor vehicles. To ensure the expenditure on motor vehicles includes all motor vehicles purchases (i.e. including via salary sacrifice), adjustments are made to the relevant HES items. For that reason, salary sacrifice amounts reported against motor vehicles are allocated to motor vehicle purchases, registration, insurance, motor vehicle repair and servicing, and automotive fuel.

Outlier and aberrant adjustments

3.21 The HES data was compared across capital cities and over time to validate the 17th series expenditures at the expenditure class level. The HES expenditure in 2009-10 was revalued to 2015-16 dollars to derive the volume changes between the two HES reference years and compared to the 2015-16 HES.

3.22 A number of unit record adjustments were made, in particular to the smaller capital cities where HES sample sizes are smaller and, in general, the standard errors are larger. The outlier adjustment method used was winsorisation, which involves replacing an unrepresentative expenditure by the next largest estimate. Where unit record outliers could not be identified, differences were further investigated. A small number of volume changes could not be validated, resulting in adjustments using either alternative volume data or based on market intelligence.

EXPENDITURE NOT SOURCED FROM HES

New dwelling purchase by owner-occupiers

3.23 New dwelling purchase by owner-occupiers in the CPI includes the net additions of household sector dwellings as a measure of owner-occupier housing costs. This includes new homes (excluding land) and major improvements. Sales of houses that take place between households (generally established dwellings) are excluded so that the weights relate only to net additions to the housing stock arising from household purchases from other sectors (i.e. from businesses such as builders and developers). Expenditure on New dwelling purchase by owner-occupiers comprises of four components: owner-occupied housing, first home owners' grants, alterations and additions, and installed appliances.

3.24 To derive the owner-occupied housing component, expenditure is estimated by multiplying the average value of private dwelling completions for the reference period by the change in the owner-occupied housing stock.

3.25 The average value of private dwelling completions for 2015-16 is obtained from *Building Activity, Australia* (cat. no. 8752.0).

3.26 The change in the owner-occupied dwelling stock is sourced from National Accounts HFCE estimates. This differs to the 16th series where the change was derived using 2006 Census of Population and Housing capital city counts of owner-occupied households, moved forward using household projections from *Household and Family Projections, Australia* (cat. no. 3236.0).

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

3.27 Consistent with standard practice relating to the inclusion of subsidies in the CPI, subsidies paid to first home buyers are treated as negative expenditure and subtracted from the new dwelling purchase by owner–occupiers house acquisition expenditure.

3.28 Expenditure on alterations and additions is derived from the alterations and additions component of Private GFCF from the National Accounts. Expenditure on installed appliances is sourced from HFCE data. Both items are added to the estimate for house acquisition to provide the total expenditure on New dwelling purchase by owner–occupiers. This differs from the 16th series, where both items were derived from the HES.

Motor vehicles

3.29 The weight for Motor vehicles in the CPI and SLCIs is derived from National Accounts HFCE data. This weight reflects purchases of new cars, transfer of used cars to the household sector (from business or government) and the service fee from the transfer of second hand cars.

Tertiary education

3.30 Expenditure on higher education in the HES includes Higher Education Loan Program (HELP) payments made by households upfront, plus any HELP repayments made through the taxation system during the reference period. This measure aligns with the outlays approach used for the SLCIs, however is not consistent with the concept of an acquisitions–based CPI, where expenditures should reflect the cost to households of the education service acquired during the reference period. The CPI scope includes the actual payments made during the period (upfront payments), plus fees for education services acquired during the period, but deferred to be paid at a later date.

3.31 To align the household expenditure on tertiary education fees in the CPI, HELP expenditures are calculated using data from the Department of Education and Training on total upfront and deferred fees, and the number of students paying HELP loans.

Insurance

3.32 The Insurance EC covers comprehensive insurance for dwellings (including contents), motor vehicles and compulsory third party (CTP) insurance. For the purpose of measuring household price inflation, the weight for insurance in the CPI should reflect the cost of the service provided by insurers (gross premiums less claims), rather than the value of gross premiums paid. The latter is reported in the HES.

3.33 Expenditure on contents, motor vehicle and CTP insurance are derived from National Accounts HFCE data. The insurance for dwellings component is excluded from HFCE as it is considered intermediate consumption in the National Accounts. Expenditure on insurance for dwellings is instead sourced from National Accounts estimates of intermediate consumption of the Ownership of dwellings industry. These National Accounts estimates align with the conceptual basis of Insurance in the CPI.

3.34 This differs from the 16th series where HES gross premiums were adjusted onto a net basis using information collected by the Australian Prudential Regulation Authority (APRA) and from insurance companies.

3.35 Expenditures funded by claims are added back to the appropriate items. The data source has been changed to be consistent with National Accounts data. This differs to the 16th series, where claims–to–premiums ratios were calculated using APRA and insurance company data, and then applied to the HES gross premiums.

CHAPTER 3: DESCRIPTION OF THE 17TH SERIES WEIGHTING PATTERN: SOURCES AND METHODS

3.36 It should be noted that HES estimates of insurance are used in deriving the expenditure weights in the SLCIs. As the SLCIs are measured on an outlays basis, the weight of Insurance reflects the gross value of premiums paid by households.

Financial services

3.37 Expenditure on financial services in the CPI cannot be sourced from the HES as it is either not directly observable or the HES did not capture the transactions in sufficient volumes or detail. The Financial services sub-group includes two expenditure classes: Deposit and loan facilities (direct charges) and Other financial services.

Deposit and loan facilities (direct charges)

3.38 Expenditure on Deposit and loan facilities (direct charges) is determined through the use of administrative data sets (obtained from financial institutions and government reporting agencies) of financial institution fees and charges for Australian households.

Other financial services

3.39 Other financial services include real estate agent services, legal and conveyancing services, stockbroking services and taxes on property transfers (stamp duty).

3.40 The real estate fees component of the National Accounts Private GFCF ownership transfer costs series is used to derive expenditure on real estate agent services. This represents a change from the 16th series, where expenditure was derived from property transaction data over the 2009-10 period and unpublished ABS survey data on real estate agents' fees.

3.41 Expenditure on legal and conveyancing services is also derived from the Private GFCF ownership transfer costs series from National Accounts.

3.42 National Accounts HFCE data is used to derive an estimate of household expenditure on stockbroking services.

3.43 Expenditure on taxes on property transfers is compiled using data supplied by the State and Territory Revenue Offices.

REVALUING EXPENDITURE TO THE LINK PERIOD

3.44 The expenditure weights derived from the HES are based on expenditures (i.e. price x quantity) in 2015-16 (the weight reference period). These new expenditure patterns will not be introduced into the CPI and SLCIs until the December quarter 2017 (with September quarter 2017 as the link period). Prior to implementation, in line with current CPI and international practice, the expenditures have been revalued to the September quarter 2017 to preserve the underlying quantities, but take into account the price changes that have occurred between the weight reference and link periods.

3.45 The calculation of the revalued estimates involves taking the 2015-16 expenditures and multiplying them by revaluation factors. These factors are derived as the ratio of the component's September quarter 2017 price index to the average of its quarterly price indexes for 2015-16.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

4.1 The CPI and SLCI weights reflect the relative expenditures of the CPI population group and SLCI sub-groups. The weights reflect average expenditure of households and not the expenditure of an 'average household'. The household average weekly expenditure (AWE) and corresponding 17th series CPI weights for the CPI groups are shown in Table 4.1.

TABLE 4.1: 17th series CPI, average weekly expenditure and weights, September quarter 2017, weighted average of eight capital cities

<i>CPI group</i>	<i>Average weekly expenditure (2015-16 quantities, September quarter 2017 prices) (a)</i>	<i>CPI weight</i>
	\$	%
All groups CPI	1,594.18	100.0
Food and non-alcoholic beverages	256.55	16.09
Alcohol and tobacco	113.02	7.09
Clothing and footwear	56.56	3.55
Housing	361.49	22.68
Furnishings, household equipment and services	149.62	9.39
Health	86.57	5.43
Transport	164.51	10.32
Communication	42.70	2.68
Recreation and culture	202.62	12.71
Education	68.05	4.27
Insurance and financial services	92.50	5.80

(a) Derived from 2015-16 ABS Household Expenditure Survey and other sources.

Note: Any discrepancies between totals and sums of components in this table are due to rounding.

4.2 The 17th series CPI weights and household average weekly expenditure by group, sub-group and expenditure class as at September quarter 2017 are shown in Appendix 1 and in the data cube *Consumer Price Index: 17th Series Weighting Pattern* (cat. no. 6473.0). For the SLCIs, this information is available from *Selected Living Cost Indexes: 17th Series Weighting Pattern* (cat. no. 6474.0).

4.3 Total household expenditure in the CPI basket increased by 16.3% from \$1,371.30 per week in 2009-10 (at June quarter 2011 prices) to \$1,594.18 in 2015-16 (at September quarter 2017 prices). The All groups CPI increased 14.3% over the same period, while wages growth was 19.3% (Wage Price Index, cat. no. 6345.0). Table 4.2 summarises the changes in expenditure by group.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Table 4.2: Average weekly expenditure between the 16th and 17th series CPI

CPI group	16th series average weekly expenditure (2009-10 quantities, June quarter 2011 prices) (a)	17th series average weekly expenditure (2015-16 quantities, September quarter 2017 prices) (b)	Percentage change
	\$	\$	%
All groups CPI	1,371.30	1,594.18	16.3
Food and non-alcoholic beverages	230.87	256.55	11.1
Alcohol and tobacco	96.87	113.02	16.7
Clothing and footwear	54.58	56.56	3.6
Housing	305.75	361.49	18.2
Furnishings, household equipment and services	124.79	149.62	19.9
Health	72.56	86.57	19.3
Transport	158.39	164.51	3.9
Communication	41.81	42.70	2.1
Recreation and culture	172.30	202.62	17.6
Education	43.67	68.05	55.8
Insurance and financial services	69.71	92.50	32.7

(a) Derived from 2009-10 ABS Household Expenditure Survey and other sources.

(b) Derived from 2015-16 ABS Household Expenditure Survey and other sources.

Note: Any discrepancies between totals and sums of components in this table are due to rounding.

CHANGES IN WEIGHTING PATTERNS

4.4 A detailed comparison of the 16th and 17th series CPI weights is presented in Appendix 2. Before analysing the changes to the weighting patterns over time, a number of points should be noted.

Quantities underlying the weights are fixed

4.5 Although the weights are expressed in terms of expenditure shares, it is not the expenditure shares (where expenditure is given by the product of quantity and price) that are held constant (or fixed) from period to period. What are held constant are the quantities of products underpinning these expenditures. Weights are presented in expenditure terms because it is not possible to present quantity weights in a comparable way. The relative expenditure shares of items will change over time in response to changes in relative prices. The weights in the 17th series CPI and SLCIs generally relate to expenditures in 2015-16. These have been revalued using price movements to September quarter 2017 (the 'link' quarter) prices, maintaining fixed '2015-16 quantities'. For more information see Chapter 4: Price Index Theory in *Consumer Price Index: Concepts, Sources and Methods* (cat. no. 6461.0).

Weights are relative

4.6 The weight of an expenditure class depends on how expenditure on that class compares to total expenditure (i.e. expenditure shares). If the increase in expenditure on a particular expenditure class in the reference period is greater than the increase in total expenditure between two series, the weight of that expenditure class will increase. For example, between the 16th and 17th series, the expenditure share on 'Restaurant meals' in the CPI increased from 2.81% to 3.32%, driven by an increase in average weekly expenditure of 37.3%. Conversely, if the increase in expenditure on a particular expenditure class in the reference period is less than the increase in total expenditure between two series, the weight of that expenditure class will decrease. For example, in the 17th series the expenditure on 'Waters, soft drinks and juices' increased by less than the increase in overall expenditures. As a result, the weight fell from 0.87% in the 16th series to 0.75% in the 17th series.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Changes in weights between the 16th and 17th series

4.7 The changes in CPI and SLCI weights between the 16th and 17th series can be broken down into price and volume effects. The volume change captures both quality and quantity changes between the reference years 2009-10 and 2015-16. The volume changes were calculated by removing the price change (corresponding price index measure) between the two periods. The corresponding CPI and SLCI price movements were used as the measures of price change.

4.8 For the CPI population, households continue to spend the most on Housing, followed by Food and non-alcoholic beverages and Recreation and culture. Although Food and non-alcoholic beverages remains one of the most heavily weighted CPI groups, it fell as a proportion of household spending between the 16th and 17th series. Communication and Clothing and footwear represent the smallest portions of household expenditure.

4.9 The changes in CPI weights and average weekly expenditures for a selected number of groups and ECs are discussed in more detail below. All analysis refers to the weighted average of the eight capital cities.

Food and non-alcoholic beverages group

4.10 Despite average weekly expenditure rising by \$25.68, the weight of the Food and non-alcoholic beverages group decreased 0.75 percentage points (pp) to 16.09%. This reflects the strong competition that has occurred on food items over recent years, which has kept prices and expenditure growth relatively low. Compared to the 16th series, weights fell across most food products.

4.11 The weight for Fruit fell from 1.60% to 1.07%. Average weekly expenditure decreased 22.1% from \$21.97 to \$17.11. The 16th series weight for Fruit was impacted by adverse weather conditions, which affected supply and pushed up prices. These conditions have not been as prevalent or as long-lived during the 17th series, resulting in the weight for Fruit returning to more normal levels.

4.12 Partially offsetting the falls was Restaurant meals, which recorded the strongest increase in weight within the group (+0.51pp). Average weekly expenditure increased from \$38.55 to \$52.94. This is supported by strong price and volume growth, as consumer preferences shift from goods towards experiences.

Housing group

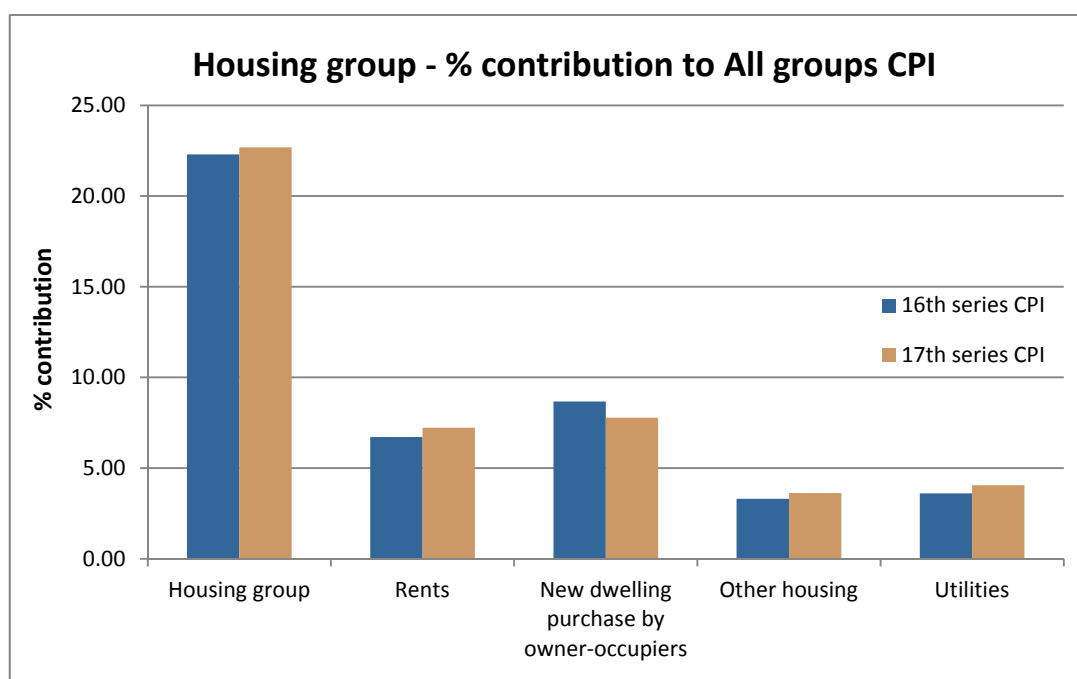
4.13 Average weekly expenditure on Housing increased by 18.2% between the 16th and 17th series, from \$305.75 to \$361.49. Rents and Electricity were the major contributors to the increase in average weekly expenditure.

4.14 A moderate increase in the weight of Housing was recorded (+0.38pp), with a greater proportion of expenditure on Rents and Utilities partially offset by a fall for New dwelling purchase by owner-occupiers (Graph 4.1).

4.15 The weight of Utilities, comprising Water and sewerage, Electricity, and Gas and other household fuels, increased 0.45pp to 4.06%. Average weekly expenditure rose 30.8%, from \$49.45 to \$64.66. This increase was predominantly price driven, with prices rising 45.6% between 2009-10 and 2015-16. Higher wholesale and network costs have contributed to the rise.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Graph 4.1: Housing group - % contribution to All groups CPI



Q: Why have the weights of *New dwelling purchase by owner-occupiers* and *Rents* moved in opposite directions between the 16th and 17th series?

A: Strong house price growth is indirectly strengthening the weight of *Rents*, but having the opposite impact on *New dwelling purchase by owner-occupiers*.

Detailed information:

In the CPI, owner-occupied housing is represented by purchases of new dwellings (net additions to the housing stock) and the increase in the volume of housing due to renovations and extensions. This can be a challenging concept to understand. One way to think about it is the following.

The CPI measures price inflation for the household sector. Therefore it is necessary to consider the purchases of dwellings between the household sector and other sectors of the economy, rather than within the sector. From this perspective, it is only purchases of newly built dwellings and those dwellings that have been acquired by households from outside the sector (e.g. private purchases of houses previously owned by the government) that are relevant. Purchases of established dwellings generally occur between households and are excluded. Additionally, the CPI is interested in measuring the prices of consumption goods and services. Land is considered an investment purchase, as it does not deteriorate over time, and is therefore out of scope. This leaves the CPI to only measure the price of new dwelling structures.

New dwelling purchase by owner-occupiers is the major component of Housing costs and household spending overall for the CPI population. However, its weight fell between the 16th and 17th series, from 8.67% to 7.78%, with average weekly expenditure increasing by only \$5.21. Although there has been an overall increase in the rate of additions to the owner-occupier dwelling stock since 2009-10, driven by strong building activity over recent years, there has also been a compositional shift, led by strong price growth in detached houses, towards cheaper apartment living. The proportion of apartment construction approvals has risen from 18.2% to 34.7% of total new dwelling approvals between 2009-10 and 2015-16.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

The increase in apartment construction has delivered dwellings that are less expensive than low density housing, due to increased supply and lower construction costs brought on by cheaper inputs. Coupled with price growth for other residential construction rising at a much slower pace compared to house construction between 2009-10 and 2015-16 (7.4% vs. 17.2%, Producer Price Indexes), this has resulted in a decrease in the weight of New dwelling purchase by owner-occupiers in the CPI.

Conversely, Rents, the second most significant component of the CPI and Housing group increased in weight between the 16th and 17th series, from 6.71% to 7.22%. Average weekly expenditure rose 25.1%, from \$92.01 to \$115.12. It should be noted that this value represents an average expenditure across the entire CPI population, and not just households that rent.

The increase in the weight for Rents was due to rises in both prices and volumes. Strong growth in house prices over the last 5 years has led to an increase in the proportion of renters in Australia's capital cities, pushing up expenditure on rents. 2016 Census data shows that 30.2% of occupied private dwellings are rented, up from 28.8% in 2011. The strong demand for rental properties has also impacted prices, with price growth of 20.2% between 2009-10 and 2015-16.

Table – *Weights for Housing group, 16th and 17th series comparison, CPI*

Component	17th series weight (a) (%)	16th series weight (a) (%)	Change in weight from 16th series (pp)
Housing group	22.68	22.30	+0.38
New dwelling purchase by owner-occupiers	7.78	8.67	-0.89
Rents	7.22	6.71	+0.51

(a) Expenditure as a proportion of total household spending

Furnishings, household equipment and services group

4.16 Average weekly expenditure on Furnishings, household equipment and services increased by 19.9% to \$149.62. This resulted in the weight of the group increasing from 9.10% to 9.39%.

4.17 Child care was the predominant contributor to the rise, increasing as a proportion of household expenditure from 0.69% to 1.35%. This was partially offset by falls in weights for a number of the goods components, including Furniture (-0.24pp), Household textiles (-0.12pp) and Major household appliances (-0.09pp), driven by subdued price growth as a result of retail competition and imports.

Q: What influences are contributing to an almost doubling of the weight of *Child care* in the CPI?

A: Increased demand for child care services, changes in industry standards and pricing pressures for centres have led to strong growth in expenditure on child care between the 16th and 17th series.

Detailed information:

Child care in the CPI and SLCIs encompasses services provided at community, private and family-based child care establishments. Both full-time and part-time care are included. Expenditure is measured on an out-of-pocket basis, i.e. gross fees payable, less any subsidies households receive on child care services.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

The expenditure share of Child care in the CPI has risen from 0.69% to 1.35% between the 16th and 17th series. Average weekly expenditure increased by 127.1%, from \$9.47 to \$21.51. While this figure might appear low, it should be noted that it represents the average weekly expenditure (on a net basis) of all households in the CPI population, not just those who use child care services.

This rise in the expenditure and weight of Child care is driven by increased demand, which has also resulted in significant upward pressure on prices. Contributing to increased demand has been rising workforce participation, particularly for women. Over the last 20 years, the participation rate of women in the workforce has increased from 53.8% in January 1997 to 59.1% in January 2017 (*Labour Force, Australia*, cat. no. 6202.0). Between 2009-10 and 2015-16, the increase has been around 0.8 of a percentage point.

The rise in workforce participation has contributed to a strong increase in the number of children in approved care, as well as increased hours for those in care (Early Childhood and Child Care in Summary, Department of Education and Training). Approved care refers to care provided by Long Day Care, Family Day Care and In-Home Care, Outside School Hours and Occasional Care services. In particular, the number of children in approved care increased 43.5% between September quarter 2009 and June quarter 2016. While pushing up costs for families, this is also resulting in increased costs for child care centres which are being passed on to parents in the form of higher fees.

Also contributing to price growth has been changes in industry standards, including higher qualification requirements for teachers in early childhood care (implemented on 1 January 2014) and increased educator-to-child ratios (implemented on 1 January 2016). Overall, prices for child care have risen 60.0% between 2009-10 and 2015-16, the largest rise of all ECs apart from Tobacco.

The rise in expenditure, driven by higher gross fees and volumes, has more than offset increases in government financial assistance for child care between the 16th and 17th series, resulting in a significant increase in the weight of Child care in the CPI.

In terms of the SLICs, Employee households are the most likely to use child care services, and therefore were the most heavily impacted by these conditions. The expenditure share of Child care rose 0.90pp for Employee households, to 1.72% of total expenditure.

Table – *Weight of Child care, 16th and 17th series comparison, CPI and by household type*

Household type	17th series weight (a) (%)	16th series weight (a) (%)	Change in weight from 16th series (pp)
CPI	1.35	0.69	+0.66
PBLCI (b)	0.57	0.26	+0.31
Employee households	1.72	0.82	+0.90
Age pensioner households	-	-	-
Other government transfer recipient households	1.05	0.44	+0.61
Self-funded retiree households	-	-	-

(a) Expenditure on child care as a proportion of total expenditure for each household type

(b) PBLCI is an aggregation of Age Pensioner and Other government transfer recipient households

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Health group

4.18 Although the Health group recorded a moderate increase in weight from the 16th series (5.29% to 5.43%), there has been a slight shift in expenditure share away from Pharmaceutical products, which decreased from 1.17% to 1.03%, predominantly due to subdued price growth.

4.19 In contrast, the weight for Medical and hospital services rose from 3.42% to 3.73%, and is the predominant driver of Health costs increasing as a proportion of overall household spending. Average weekly expenditure increased by 27.0%, from \$46.85 to \$59.49. The strong rise in private health insurance premiums over this period was the major contributor to the increase. Between 2010 and 2016, premiums increased 5.71% per year on average at the industry weighted level (Department of Health).

Q: With the ageing population in Australia, why has the weight of *Pharmaceutical products* fallen across the CPI and most household types?

A: Government policies and initiatives have contributed to subdued growth in out-of-pocket expenses for medicines.

Detailed information:

Pharmaceutical products are a fundamental component of the health system and are used by a large number of households to prevent, alleviate and cure illness.

With an ageing population, there is a greater reliance on these medicines. As a result, changes in prices will have a relatively large effect on household out-of-pocket expenses, that is, the final price the household pays after subsidies. Price growth of pharmaceutical products has been fairly subdued compared to other health costs such as Private Health Insurance, which has seen significant price increases since 2009-10.

Weak price growth for pharmaceuticals reflects additional medicines being added on to the Pharmaceutical Benefits Scheme (PBS) schedule, as well as government initiatives such as Simplified Price Disclosure. In 2015-16 alone, there were 370 new and amended PBS listings (Department of Health 2015-16 Annual Report). This included high cost medicines for the treatment of breast cancer, melanoma and hepatitis C. The Simplified Price Disclosure program builds on the changes to price disclosure policy made in 2012 under Expanded and Accelerated Price Disclosure (EAPD), and allows PBS prices to be adjusted to market prices more quickly than the previous approach. This measure came into effect in 2014. A more recent initiative allowing pharmacists to offer a discount of up to \$1.00 on scripts where a co-payment is made (from 1 January 2016) has also contributed to the fall in weight between the 16th and 17th series.

Combined with increased retail competition in the industry, these government initiatives are helping to subdue the rate of price growth and reduce households' out-of-pocket costs. The following table presents the proportion of household expenditure on pharmaceutical products by household type and for the CPI. Age pensioners spend the greatest proportion of their expenditure on pharmaceutical products, more than double the proportion spent by CPI households, but also showed the largest fall in weight between the 16th and 17th series, as they benefit most from these government programs.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Table – *Weight of Pharmaceutical products, 16th and 17th series comparison, CPI and by household type*

Household type	17th series weight (a) (%)	16th series weight (a) (%)	Change in weight from 16th series (pp)
CPI	1.03	1.17	-0.14
PBLCI (b)	1.92	2.06	-0.14
Employee households	0.95	1.06	-0.11
Age pensioner households	2.49	3.06	-0.57
Other government transfer recipient households	1.44	1.39	+0.05
Self-funded retiree households	2.00	2.08	-0.08

(a) Expenditure on pharmaceutical products as a proportion of total expenditure for each household type

(b) PBLCI is an aggregation of Age Pensioner and Other government transfer recipient households

Transport group

4.20 Transport costs fell as a proportion of total household expenditure, recording the largest fall of all the groups in the CPI (-1.23pp). Average weekly expenditure on Transport rose by only 3.9%, from \$158.39 to \$164.51.

4.21 The main driver was Automotive fuel, which recorded a fall in weight of 0.77pp to 2.78%. Average weekly expenditure decreased 8.8% from \$48.67 to \$44.39. This was predominantly a result of falls in the world oil price.

4.22 Motor vehicles also recorded a fall in weight, with average weekly expenditure remaining relatively unchanged between the 16th and 17th series. Vehicles have become cheaper over the period, driven by increased competition between brands for sales, manufacturing changes which have enabled cars to be built more cheaply, and a higher proportion of imported cars being sold.

Education group

4.23 The Education group recorded the largest increase in weight in the 17th series CPI, up 1.09pp to 4.27%, although it still remains a small component of household spending. Secondary education recorded the largest increase, up 0.44pp to 1.70%. This was followed by Preschool and primary education, up 0.40pp to 0.92%, and Tertiary education, up 0.25pp to 1.65%.

Q: What factors are behind the *Education* group recording the largest increase in weight between the 16th and 17th series CPI?

A: Prices and enrolment numbers have increased across all levels of education between 16th and 17th series.

Detailed information:

The cost of education at any level can be driven by several factors such as; changes in student numbers, government regulatory policies on education or funding, or standards (e.g. increased teacher-to-student ratios, services or syllabus).

For CPI purposes, the Education group comprises all expenditure on primary, secondary and tertiary education, and preschool services. Both private and public institutions are included.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Education is a necessity and compulsory at certain levels, so it is very difficult for households to avoid any price changes. Despite the availability of schools and universities, households may not substitute in response to price changes. This is because parents might have a particular preference in the type or location of their child's education, or because prices change similarly across the various institutions available to them.

Any growth in student enrolment puts additional pressure on schools, resulting in increased costs which are generally passed on. The number of student enrolments increased between 2009-10 and 2015-16. As of May 2016, nearly 20% of the population were enrolled in some form of study, with the proportion of people studying increasing across most of the demographics in the past 10 years (*Education and Work, Australia*, cat. no. 6227.0). At the primary and secondary education levels, the number of enrolments increased 9.0% between 2009 and 2016 (*Schools, Australia*, cat. no. 4221.0).

Additionally, between 2009 and 2016, there has been a slight shift in preference towards non-government schools, which are typically more expensive. The number of students enrolled in non-government schools (catholic and independent) increased 10.4%, compared to an 8.2% rise for government schools. This trend has started to reverse in the last two years.

The increased enrolments have contributed to higher fees for students. Prices rose across all the ECs between 2009-10 and 2015-16: Preschool and primary education (+37.7%), Secondary education (+41.6%) and Tertiary education (+33.9%).

Table – *Weights for Education group, 16th and 17th series comparison, CPI*

Component	17th series weight (a) (%)	16th series weight (a) (%)	Change in weight from 16th series (pp)
Education group	4.27	3.18	+1.09
Preschool and primary education EC	0.92	0.52	+0.40
Secondary education EC	1.70	1.26	+0.44
Tertiary education EC	1.65	1.40	+0.25

(a) Expenditure as a proportion of total household spending

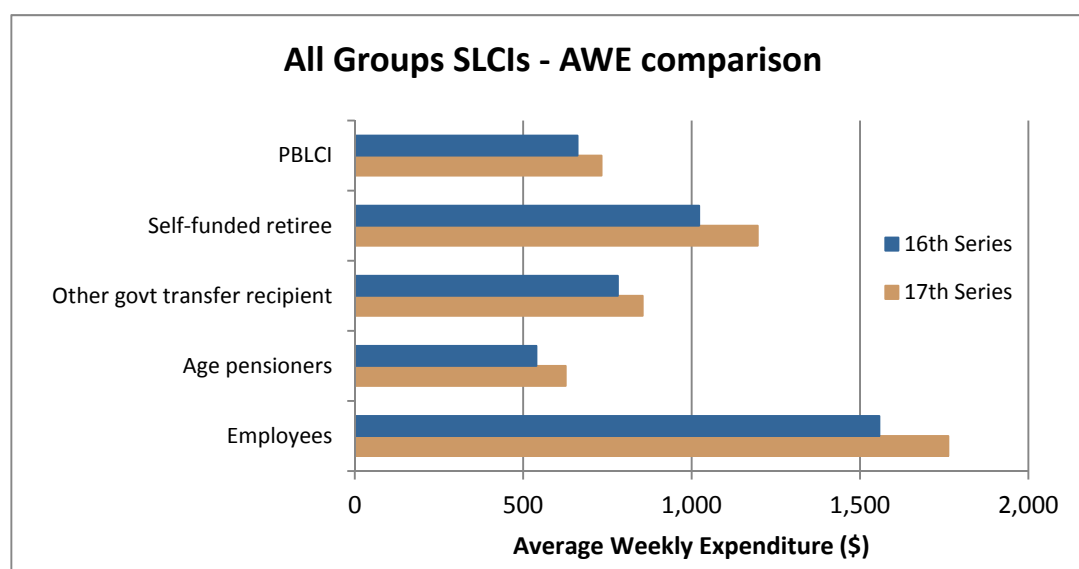
Expenditure weights for the SLCIs

4.24 The SLCIs are produced as a by-product of the CPI, with the main conceptual difference being that the SLCIs are constructed on an outlays basis, while the CPI is constructed on an acquisitions basis. The SLCIs are designed to measure the change in out-of-pocket living expenses of four Australian household types: Employee, Age pensioner, Other government transfer recipient, and Self-funded retirees. The PBLCI combines the Age pensioner and Other government transfer recipient household types. See paragraphs 3.3 to 3.5 for SLCI concepts and conceptual differences.

4.25 At the 8 caps level, average weekly expenditure grew for all population sub-groups between the 16th and 17th series (Graph 4.2). The increase ranged from \$71.42 for PBLCI households, to \$204.75 for Employee households.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Graph 4.2: All groups SLCIs – AWE comparison



4.26 Housing and Food and non-alcoholic beverages remain the significant components of household expenditure for most population sub-groups. All sub-groups recorded an increase in weight for Housing, driven by Rents and Utilities. Other government transfer recipients recorded the most significant rise, due to having a greater proportion of renters.

4.27 The weight of Health also increased across all population sub-groups, with Self-funded retirees and Age pensioners showing the largest movements, increasing from 8.53% to 10.31% and 8.85% to 10.22% respectively. These rises were driven by Medical and hospital services, following significant increases in private health insurance premiums over the period.

4.28 Conversely, Clothing and footwear has fallen as a proportion of expenditure across all population sub-groups. This is driven predominantly by price falls in garments as a result of increased competition from online and international entrants to the Australian retail market.

4.29 Changes in the weights for Insurance and financial services varied across the sub-groups, driven by the different proportions of owner-occupier and renter households. Employee and Other government transfer recipient households recorded falls in weight driven by lower interest charges, with the cash rate reaching record lows during 2015-16. Exposure to mortgages is lower for the remaining household types, and combined with increases in gross premiums for insurance, resulted in increases in their weights for Insurance and financial services.

Q: Why do price changes in Utilities affect *Age pensioner* and *Other government transfer recipient* households relatively more than other households?

A: Because *Age pensioner* and *Other government recipient* households spend the greatest proportion of their household budget on utilities.

Detailed information:

When the prices of products change, what's important to consumers is: by how much did the price change; the proportion of the household budget spent on these products; and whether substitute products are available so consumers can avoid some of these price changes.

CHAPTER 4: 17TH SERIES EXPENDITURE WEIGHTS

Household Utilities are essential features of Australian dwellings. Utilities, for the purposes of the Australian CPI and SLCIs, relate to: Water and sewerage, Electricity, and Gas and other household fuels. Utilities are consumed by households during most home based activities, whether it's boiling the kettle for a cup of tea, taking a shower or watching TV.

The amount of water, electricity and gas consumed by households and their prices can significantly impact household budgets. In part this is because it's very difficult for consumers to avoid price changes for utilities. That is, substitutes aren't readily available.

The proportion of the household budget spent on utilities is also important when prices change. The following table presents the proportion of household expenditure on utilities by household type and for the CPI. Age pensioner and Other government transfer recipient households (and subsequently Pensioner and beneficiary households) spend the greatest proportion of their household budget on utilities; significantly more than the proportion spent by Employee households.

So when the price of utilities change, it is Age pensioner and Other government transfer recipient households that are most affected.

Table – Weight of Utilities, 16th and 17th series comparison, CPI and by household type

Household type	17th series weight (a) (%)	16th series weight (a) (%)	Change in weight from 16th series (pp)
CPI	4.06	3.61	+0.45
PBLCI (b)	6.28	5.48	+0.80
Employee households	3.94	3.28	+0.66
Age pensioner households	6.83	6.09	+0.74
Other government transfer recipient households	5.82	5.06	+0.76
Self-funded retiree households	5.09	4.03	+1.06

(a) Expenditure on utilities as a proportion of total expenditure for each household type

(b) PBLCI is an aggregation of Age Pensioner and Other government transfer recipient households

CHAPTER 5: ESTIMATING THE UPPER LEVEL SUBSTITUTION BIAS IN THE AUSTRALIAN CPI

5.1 Consumers' purchasing patterns react to price change over time, where goods and services with high inflation are typically substituted with low inflation alternatives. Like most CPIs, the Australian CPI uses a fixed-base Laspeyres-type formula (also known as the Lowe index formula), which 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. This overstates the price change of the basket as it is not able to take account of the substitution consumers make in response to relative price change and changes in preferences, resulting in substitution bias.

5.2 With each release of the new CPI weights, the ABS constructs a retrospective superlative-type index which more closely reflects true inflation. This enables an estimate of the upper level substitution bias in the Australian CPI to be derived. This superlative index takes the weights from both the earlier and later periods into consideration, thereby accounting for substitution across goods and services (in this case expenditure classes).

5.3 In the past, the ABS has used the following methodology to derive an estimate of the substitution bias:

- Construct Laspeyres-type (Lowe), Paasche-type and superlative Fisher-type indexes at the All groups CPI level, using the published CPI weights. These weights have been price updated from the period of the HES survey (1998-99, 2003-04 and 2009-10) to the link period, which is the quarter prior to the implementation of the weights (June quarter 2000, June quarter 2005 and June quarter 2011).
- For the Paasche-type index, which requires current period weights, a linear model is applied between re-weighting periods to obtain quarterly weights.
- An estimate of the upper level substitution bias is then obtained as the difference between the Fisher-type index (the geometric mean of the Laspeyres and Paasche) and the Laspeyres-type index, which represents the CPI.

5.4 As part of the 17th series review, the ABS conducted an investigation into the methodology used to estimate substitution bias. This has resulted in changes to the previous methodology, enabling more accurate estimates to be calculated.

5.5 The methodology applied in the 17th series is as follows:

- Calculate financial year Laspeyres and Paasche-type indexes, instead of quarterly, using the original HES weights for each series of the CPI and financial year estimates of price change. Under this approach, the Laspeyres index is a true Laspeyres, and not a Lowe index as was previously the case.
- For the Paasche index, the weights for each financial year in between re-weighting periods are interpolated using a linear model.
- The geometric mean of the Laspeyres and Paasche approximates the Fisher.
- The Fisher is compared to the Laspeyres index to estimate the level of substitution bias, consistent with international practice.

5.6 This approach results in a more accurate estimate of true inflation, due to the original financial year weights being used, and the period of the indexes and weights now aligning.

5.7 Using this methodology, the ABS has produced an upper level substitution bias estimate for the 1998-99 to 2015-16 period. The results reveal that the amount of bias in the Australian CPI is on average 0.22 of a percentage point per year between 1998-99 and 2015-16, due to the inability to take account of the upper level item substitution effect. This is lower than previously estimated (+0.24 of a percentage point between June 2000 and June 2011), predominantly due to the low inflationary environment over recent years.

CHAPTER 5: ESTIMATING THE UPPER LEVEL SUBSTITUTION BIAS IN THE AUSTRALIAN CPI

5.8 The results also show that the average annual substitution bias increases at a faster rate the longer the period between re-weights. Table 5.1 illustrates that the average annual bias is 0.11 one year after a re-weight, increasing to 0.20 in the sixth year.

Table 5.1 Average Annual Item Substitution Bias (a)

<i>Time since re-weight</i>	<i>Bias (Laspeyres – Fisher)</i>
1 year	0.11
2 years	0.17
3 years	0.17
4 years	0.18
5 years	0.21
(b) 6 years	0.20

(a) This takes the average of the annual substitution bias for the 1998-99 to 2003-04, 2003-04 to 2009-10 and 2009-10 to 2015-16 periods.
(b) The six year average annual substitution bias is only based on the 2003-04 to 2009-10 and 2009-10 to 2015-16 periods.

5.9 With the move to annual re-weighting, the ABS will continue to review the methodology for producing estimates of substitution bias. While the weights will be updated more frequently in future, there are other challenges such as differing data sources that need to be addressed. The ABS will conduct these investigations and provide an update of intentions in due course.

CHAPTER 6: UPCOMING WORK

6.1 The weights detailed in this information paper will be implemented into the CPI and SLCIs in the December quarter 2017 publications, due to be released on 31 January 2018 and 7 February 2018 respectively.

6.2 Coinciding with the update of the weights will be the introduction of new CPI index methods (known as multilateral methods) for 28 ECs. These methods enable a census of products to be used from transactions datasets and the weighting of prices at the product level, enhancing the quality of the CPI. For further information on this change, see *Information Paper: An Implementation Plan to Maximise the Use of Transactions Data in the CPI* (cat. no. 6401.0.60.004).

6.3 From 2018, the Australian CPI will be re-weighted annually in December quarters. The primary data source for updating the weights in inter-HES years will be HFCE data from the National Accounts. The approach and plan to annually re-weight the CPI was detailed in the following information papers:

- *Information Paper: Increasing the Frequency of CPI Expenditure Class Weight Updates* (cat. no. 6401.0.60.002)
- *Information Paper: An Implementation Plan to Annually Re-weight the Australian CPI* (cat. no. 6401.0.60.005)

6.4 Due to household income characteristics not being available from the HFCE data, it had been proposed to continue to re-weight the SLCIs six-yearly using HES data. The ABS is continuing to investigate methods to annually re-weight the SLCIs, which was raised by key stakeholders in consultations as further research to consider. Further information on the re-weighting of the SLCIs will be published in 2018.

6.5 In relation to the Deposit and loan facilities (indirect charges) index, also known as Financial Intermediation Services Indirectly Measured (FISIM), the ABS will continue to engage internationally to resolve the methodological challenges associated with its measurement. Although it had been intended to reintroduce FISIM into the headline CPI in time for the 17th series, this has not been possible due to the lack of an internationally accepted methodology for its measurement. The ABS will continue to produce the analytical series 'All groups CPI including Deposit and loan facilities (indirect charges)'. Once the methodology and data are sufficiently robust to produce high quality estimates, the ABS will consider reintroducing FISIM into the headline CPI.

APPENDIX 1: 17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS

17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS, SEPTEMBER QUARTER 2017,
WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a)

Group	Average weekly expenditure for the Weighted average of eight capital cities in September quarter 2017		Percentage contribution to the All groups CPI in September quarter 2017	
Sub-group				
Expenditure class		\$		%
FOOD AND NON-ALCOHOLIC BEVERAGES	256.55		16.09	
Bread and cereal products	23.68		1.49	
Bread		8.56		0.54
Cakes and biscuits		10.42		0.65
Breakfast cereals		2.06		0.13
Other cereal products		2.63		0.17
Meat and seafoods	34.86		2.19	
Beef and veal		7.52		0.47
Pork		4.91		0.31
Lamb and goat		3.50		0.22
Poultry		6.82		0.43
Other meats		5.88		0.37
Fish and other seafood		6.23		0.39
Dairy and related products	15.83		0.99	
Milk		5.78		0.36
Cheese		4.70		0.29
Ice cream and other dairy products		5.34		0.34
Fruit and vegetables	37.54		2.35	
Fruit		17.11		1.07
Vegetables		20.43		1.28
Food products n.e.c.	35.24		2.21	
Eggs		1.96		0.12
Jams, honey and spreads		2.13		0.13
Food additives and condiments		4.68		0.29
Oils and fats		2.68		0.17
Snacks and confectionery		14.95		0.94
Other food products n.e.c.		8.84		0.55
Non-alcoholic beverages	15.72		0.99	
Coffee, tea and cocoa		3.71		0.23
Waters, soft drinks and juices		12.01		0.75
Meals out and take away foods	93.69		5.88	
Restaurant meals		52.94		3.32
Take away and fast foods		40.76		2.56
ALCOHOL AND TOBACCO	113.02		7.09	
Alcoholic beverages	71.50		4.49	
Spirits		13.46		0.84
Wine		28.35		1.78
Beer		29.69		1.86
Tobacco	41.51		2.60	
Tobacco		41.51		2.60
CLOTHING AND FOOTWEAR	56.56		3.55	
Garments	35.38		2.22	
Garments for men		9.64		0.60
Garments for women		20.23		1.27
Garments for infants and children		5.51		0.35
Footwear	8.55		0.54	
Footwear for men		2.26		0.14
Footwear for women		5.08		0.32
Footwear for infants and children		1.20		0.08
Accessories and clothing services	12.64		0.79	
Accessories		10.76		0.68
Cleaning, repair and hire of clothing and footwear		1.88		0.12

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding.

APPENDIX 1: 17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS

17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS, SEPTEMBER QUARTER 2017,
WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a) *continued*

Group	Average weekly expenditure for the Weighted average of eight capital cities in September quarter 2017		Percentage contribution to the All groups CPI in September quarter 2017	
Sub-group				
Expenditure class	\$		%	
HOUSING	361.49		22.68	
Rents	115.12		7.22	
Rents		115.12		7.22
New dwelling purchase by owner-occupiers	124.07		7.78	
New dwelling purchase by owner-occupiers		124.07		7.78
Other housing	57.64		3.62	
Maintenance and repair of the dwelling		34.25		2.15
Property rates and charges		23.39		1.47
Utilities	64.66		4.06	
Water and sewerage		16.28		1.02
Electricity		34.57		2.17
Gas and other household fuels		13.81		0.87
FURNISHINGS, HOUSEHOLD EQUIPMENT AND SERVICES	149.62		9.39	
Furniture and furnishings	27.06		1.70	
Furniture		22.19		1.39
Carpets and other floor coverings		4.86		0.31
Household textiles	7.87		0.49	
Household textiles		7.87		0.49
Household appliances, utensils and tools	24.80		1.56	
Major household appliances		6.58		0.41
Small electric household appliances		5.28		0.33
Glassware, tableware and household utensils		6.84		0.43
Tools and equipment for house and garden		6.10		0.38
Non-durable household products	42.18		2.65	
Cleaning and maintenance products		4.13		0.26
Personal care products		17.01		1.07
Other non-durable household products		21.04		1.32
Domestic and household services	47.71		2.99	
Child care		21.51		1.35
Hairdressing and personal grooming services		14.80		0.93
Other household services		11.40		0.72
HEALTH	86.57		5.43	
Medical products, appliances and equipment	18.82		1.18	
Pharmaceutical products		16.49		1.03
Therapeutic appliances and equipment		2.33		0.15
Medical, dental and hospital services	67.75		4.25	
Medical and hospital services		59.49		3.73
Dental services		8.25		0.52
TRANSPORT	164.51		10.32	
Private motoring	152.78		9.58	
Motor vehicles		44.38		2.78
Spare parts and accessories for motor vehicles		11.65		0.73
Automotive fuel		44.39		2.78
Maintenance and repair of motor vehicles		30.83		1.93
Other services in respect of motor vehicles		21.53		1.35
Urban transport fares	11.73		0.74	
Urban transport fares		11.73		0.74

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding.

APPENDIX 1: 17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS

17TH SERIES CPI, AVERAGE WEEKLY EXPENDITURE AND WEIGHTS, SEPTEMBER QUARTER 2017,
WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a) *continued*

<i>Group</i>	<i>Average weekly expenditure for</i>			<i>Percentage contribution to the</i>		
<i>Sub-group</i>	<i>the Weighted average of eight</i>			<i>All groups CPI in September</i>		
<i>Expenditure class</i>	<i>capital cities in September</i>			<i>quarter 2017</i>		
	<i>\$</i>			<i>%</i>		
COMMUNICATION	42.70			2.68		
Communication		42.70			2.68	
Postal services			1.33			0.08
Telecommunication equipment and services			41.37			2.59
RECREATION AND CULTURE	202.62			12.71		
Audio, visual and computing equipment and services		30.56			1.92	
Audio, visual and computing equipment			19.44			1.22
Audio, visual and computing media and services			11.13			0.70
Newspapers, books and stationery		11.61			0.73	
Books			3.92			0.25
Newspapers, magazines and stationery			7.69			0.48
Holiday travel and accommodation		92.91			5.83	
Domestic holiday travel and accommodation			42.67			2.68
International holiday travel and accommodation			50.24			3.15
Other recreation, sport and culture		67.52			4.24	
Equipment for sports, camping and open-air recreation			9.37			0.59
Games, toys and hobbies			12.84			0.81
Pets and related products			7.09			0.44
Veterinary and other services for pets			5.90			0.37
Sports participation			15.60			0.98
Other recreational, sporting and cultural services			16.73			1.05
EDUCATION	68.05			4.27		
Education		68.05			4.27	
Preschool and primary education			14.72			0.92
Secondary education			27.09			1.70
Tertiary education			26.25			1.65
INSURANCE AND FINANCIAL SERVICES	92.50			5.80		
Insurance		18.89			1.19	
Insurance			18.89			1.19
Financial services		73.61			4.62	
Deposit and loan facilities (direct charges)			9.56			0.60
Other financial services			64.04			4.02
ALL GROUPS	1,594.18	1,594.18	1,594.18	100.00	100.00	100.00

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding

APPENDIX 2: COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTING PATTERNS

COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTS, WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a)

Group Sub-group Expenditure class	16th series		17th series	
	Percentage contribution to the All groups CPI in June quarter 2011		Percentage contribution to the All groups CPI in September quarter 2017	
		%		%
FOOD AND NON-ALCOHOLIC BEVERAGES	16.84		16.09	
Bread and cereal products	1.71		1.49	
Bread		0.58		0.54
Cakes and biscuits		0.74		0.65
Breakfast cereals		0.18		0.13
Other cereal products		0.21		0.17
Meat and seafoods	2.29		2.19	
Beef and veal		0.39		0.47
Pork		0.36		0.31
Lamb and goat		0.26		0.22
Poultry		0.49		0.43
Other meats		0.38		0.37
Fish and other seafood		0.41		0.39
Dairy and related products	1.15		0.99	
Milk		0.42		0.36
Cheese		0.34		0.29
Ice cream and other dairy products		0.39		0.34
Fruit and vegetables	2.95		2.35	
Fruit		1.60		1.07
Vegetables		1.34		1.28
Food products n.e.c.	2.17		2.21	
Eggs		0.11		0.12
Jams, honey and spreads		0.14		0.13
Food additives and condiments		0.30		0.29
Oils and fats		0.17		0.17
Snacks and confectionery		0.97		0.94
Other food products n.e.c.		0.47		0.55
Non-alcoholic beverages	1.14		0.99	
Coffee, tea and cocoa		0.27		0.23
Waters, soft drinks and juices		0.87		0.75
Meals out and take away foods	5.43		5.88	
Restaurant meals		2.81		3.32
Take away and fast foods		2.62		2.56
ALCOHOL AND TOBACCO	7.06		7.09	
Alcoholic beverages	4.75		4.49	
Spirits		0.91		0.84
Wine		1.64		1.78
Beer		2.20		1.86
Tobacco	2.32		2.60	
Tobacco		2.32		2.60
CLOTHING AND FOOTWEAR	3.98		3.55	
Garments	2.52		2.22	
Garments for men		0.74		0.60
Garments for women		1.47		1.27
Garments for infants and children		0.31		0.35
Footwear	0.61		0.54	
Footwear for men		0.14		0.14
Footwear for women		0.34		0.32
Footwear for infants and children		0.13		0.08
Accessories and clothing services	0.86		0.79	
Accessories		0.74		0.68
Cleaning, repair and hire of clothing and footwear		0.12		0.12

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding.

APPENDIX 2: COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTING PATTERNS

COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTS, WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a) *continued*

Group Sub-group Expenditure class	16th series		17th series	
	Percentage contribution to the All groups CPI in June quarter 2011		Percentage contribution to the All groups CPI in September quarter 2017	
	%		%	
HOUSING	22.30		22.68	
Rents	6.71		7.22	
Rents		6.71		7.22
New dwelling purchase by owner-occupiers	8.67		7.78	
New dwelling purchase by owner-occupiers		8.67		7.78
Other housing	3.31		3.62	
Maintenance and repair of the dwelling		2.05		2.15
Property rates and charges		1.26		1.47
Utilities	3.61		4.06	
Water and sewerage		0.90		1.02
Electricity		1.99		2.17
Gas and other household fuels		0.72		0.87
FURNISHINGS, HOUSEHOLD EQUIPMENT AND SERVICES	9.10		9.39	
Furniture and furnishings	1.91		1.70	
Furniture		1.63		1.39
Carpets and other floor coverings		0.28		0.31
Household textiles	0.61		0.49	
Household textiles		0.61		0.49
Household appliances, utensils and tools	1.43		1.56	
Major household appliances		0.50		0.41
Small electric household appliances		0.24		0.33
Glassware, tableware and household utensils		0.43		0.43
Tools and equipment for house and garden		0.26		0.38
Non-durable household products	2.86		2.65	
Cleaning and maintenance products		0.29		0.26
Personal care products		1.11		1.07
Other non-durable household products		1.46		1.32
Domestic and household services	2.29		2.99	
Child care		0.69		1.35
Hairdressing and personal grooming services		0.90		0.93
Other household services		0.69		0.72
HEALTH	5.29		5.43	
Medical products, appliances and equipment	1.32		1.18	
Pharmaceutical products		1.17		1.03
Therapeutic appliances and equipment		0.14		0.15
Medical, dental and hospital services	3.97		4.25	
Medical and hospital services		3.42		3.73
Dental services		0.56		0.52

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding.

APPENDIX 2: COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTING PATTERNS

COMPARISON OF THE 16TH AND 17TH SERIES CPI WEIGHTS, WEIGHTED AVERAGE OF EIGHT CAPITAL CITIES (a) *continued*

Group	16th series			17th series		
	Percentage contribution to the All groups CPI in June quarter 2011			Percentage contribution to the All groups CPI in September quarter 2017		
			%			%
<i>Sub-group</i>						
<i>Expenditure class</i>						
TRANSPORT	11.55			10.32		
Private motoring		10.81		9.58		
Motor vehicles			3.25			2.78
Spare parts and accessories for motor vehicles			0.99			0.73
Automotive fuel			3.55			2.78
Maintenance and repair of motor vehicles			1.67			1.93
Other services in respect of motor vehicles			1.35			1.35
Urban transport fares		0.74		0.74		
Urban transport fares			0.74			0.74
COMMUNICATION	3.05			2.68		
Communication		3.05		2.68		
Postal services			0.12			0.08
Telecommunication equipment and services			2.93			2.59
RECREATION AND CULTURE	12.56			12.71		
Audio, visual and computing equipment and services		2.53		1.92		
Audio, visual and computing equipment			1.56			1.22
Audio, visual and computing media and services			0.98			0.70
Newspapers, books and stationery		1.08		0.73		
Books			0.40			0.25
Newspapers, magazines and stationery			0.68			0.48
Holiday travel and accommodation		4.76		5.83		
Domestic holiday travel and accommodation			2.47			2.68
International holiday travel and accommodation			2.29			3.15
Other recreation, sport and culture		4.20		4.24		
Equipment for sports, camping and open-air recreation			0.61			0.59
Games, toys and hobbies			0.78			0.81
Pets and related products			0.38			0.44
Veterinary and other services for pets			0.40			0.37
Sports participation			0.94			0.98
Other recreational, sporting and cultural services			1.09			1.05
EDUCATION	3.18			4.27		
Education		3.18		4.27		
Preschool and primary education			0.52			0.92
Secondary education			1.26			1.70
Tertiary education			1.40			1.65
INSURANCE AND FINANCIAL SERVICES	5.08			5.80		
Insurance		1.40		1.19		
Insurance			1.40			1.19
Financial services		3.68		4.62		
Deposit and loan facilities (direct charges)			0.76			0.60
Other financial services			2.92			4.02
ALL GROUPS	100.00	100.00	100.00	100.00	100.00	100.00

Footnotes

(a) Any discrepancies between totals and sums of components in this Appendix are due to rounding

APPENDIX 3: CALCULATING EC CONTRIBUTIONS TO CHANGE WITH AN ANNUALLY RE-WEIGHTED CPI

- 1 The availability of annual HFCE data from the National Accounts provides the ABS with an opportunity to update CPI EC level weights more frequently. However, the annual re-weight of the Australian CPI will pose a challenge when calculating contributions to the annual percentage change in the All groups CPI. This is because the contribution will depend not only on changes in prices, but also changes in the weights.
- 2 To address this, the ABS investigated an approach to estimate the contributions of individual ECs to the annual percentage change of the All groups CPI under annual re-weighting. This methodology was published in *Information Paper: An Implementation Plan to Annually Re-weight the Australian CPI* (cat. no. 6401.0.60.005).
- 3 In the current CPI where the weights are fixed for a number of years, deriving the contribution of ECs to the annual rate of inflation does not pose a problem, since the annual rate of inflation is based on a single set of weights. The annual rate of inflation for any given period is derived as the percentage change between the index number in that period, and the index number from the corresponding quarter of the previous year. For example, the annual rate of inflation in March quarter 2019 is the percentage change between the March quarter 2019 and March quarter 2018 index numbers.
- 4 The proposed approach, stated below, derives an approximate expression for the annual rate of inflation that distinguishes between the contribution due to the percentage price changes of the ECs and changes in the weights of the ECs. For a single EC n , in March quarter 2019, the contribution can be written as:

$$Cont_{na}^{2019Q1} \approx w_n^{2018Q1} \times \left(\frac{P_n^{2019Q1}}{P_n^{2018Q1}} - 1 \right) + \frac{P_n^{2019Q1}/P_n^{2018Q3}}{\hat{P}^{2019Q1}/\hat{P}^{2018Q3}} \left(w_n^{2018Q3} - \hat{w}_n^{2018Q3} \right) \quad (1)$$

where:

w_n^{2018Q1} = weight of EC n to All groups CPI in March quarter 2018

P_n^{2019Q1} = price index of EC n in March quarter 2019

P_n^{2018Q1} = price index of EC n in March quarter 2018

P_n^{2018Q3} = price index of EC n in September quarter 2018

\hat{P}^{2019Q1} = price index of the All groups CPI in March quarter 2019 using the weights of the previous short-term series

\hat{P}^{2018Q3} = price index of the All groups CPI in September quarter 2018 using the weights of the previous short-term series

w_n^{2018Q3} = weight of EC n to the All groups CPI in September quarter 2018

\hat{w}_n^{2018Q3} = weight of EC n to the All groups CPI in September quarter 2018 under the previous short-term series

Detailed information on the decomposition is available from the Appendix of *Information Paper: An Implementation Plan to Annually Re-weight the Australian CPI* (cat. no. 6401.0.60.005).

APPENDIX 3: CALCULATING EC CONTRIBUTIONS TO CHANGE WITH AN ANNUALLY RE-WEIGHTED CPI

5 The ABS has conducted an empirical analysis to assess the proposed methodology, using price indexes compiled from annually updated weights. The *t-1* indexes from the *Information Paper: Increasing the Frequency of CPI Expenditure Class Weight Updates* (cat. no. 6401.0.60.002) formed the basis of this empirical test. As noted in this paper, these indexes span the period September quarter 2005 to September quarter 2015 and exclude the Deposit and loan facilities (direct charges) EC.

6 This proposed method was applied by decomposing the equation into the two components. The first component of the equation measures the contribution of an EC due to its annual percentage change. Summed across all ECs, this component is expected to be slightly higher than the annual inflation rate based on the chained index, as annually updating the weights most likely lowers measured inflation. The empirical results from the analysis support this relationship.

7 The second component measures the contribution of each EC to the annual inflation rate due to the change in its expenditure share, where the expenditure shares are made 'comparable' by price updating them to the link quarter. Summed across all ECs, this component is generally expected to be small and negative. The empirical results from the analysis support this relationship.

8 Lastly, summing the two components across all ECs approximates the annual rate of inflation in the All groups CPI exactly to 2 decimal points over the entire analysis period, demonstrating that the decomposition works well.

APPENDIX 4: UPDATE TO 16TH SERIES CPI REVIEW OUTCOMES

This appendix provides an update on progress with the outcomes from the 16th series CPI review, detailed in *Outcome of the 16th Series Australian Consumer Price Index Review* (cat. no. 6469.0).

Outcome	Status
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.	Household inflation measurement continues to be principal purpose of the CPI. Consistent with this purpose, the acquisitions approach remains the conceptual basis for compiling the CPI.
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.	<p>The ALCIs and PBLCI publications were combined into a single product <i>Selected Living Cost Indexes, Australia</i> (cat. no. 6467.0) from the September quarter 2012 release.</p> <p>Since the 16th series, additional outlets and products have been added to the PBLCI to enhance the coverage and the representativeness of price movements. This is an ongoing process for the ABS and is addressed through a rolling sample and index review program.</p> <p>No user requirements for additional indexes compiled on an outlays basis have been identified.</p>
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.	<p>In the absence of additional funding, the ABS has investigated alternative data sources and methods to facilitate the production of a monthly CPI. These include multilateral methods and data collection techniques such as webscraping.</p> <p>Additionally, as part of the CPI's rolling review program, prices which are currently collected and compiled on a non-monthly basis are being assessed to determine if monthly collection is suitable. For further information on which ECs are currently collected monthly, see Attachment 2: Price Collection Schedule of <i>Enhancing the Australian CPI: A roadmap</i> (cat. no. 6401.0.60.001).</p>
1.4 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.	Complete

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<p>1.4 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.</p>	<p>Complete</p>
<p>1.4 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.</p>	<p>Complete</p>
<p>1.4 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.</p>	<p>The ABS has engaged internationally in attempts to resolve the measurement challenges associated with FISIM. However, many of the challenges identified as part of the 16th series remain, and at present there is no internationally endorsed methodology for the measurement of FISIM. As a result, the ABS will not reintroduce FISIM into the headline CPI for the 17th series. The ABS will continue to produce the analytical series 'All groups CPI including Deposit and loan facilities (indirect charges)', and work with our international partners in the resolution of measurement challenges.</p>
<p>1.4 e) The ABS will continue to work with data providers (financial institutions) to obtain the high quality, detailed data necessary to measure FISIM robustly.</p>	<p>Data quality for the FISIM measure has improved since the 16th series review. The ABS maintains strong relationships with the financial institutions providing data for FISIM and continually works with these providers to ensure a clear understanding of the data.</p>
<p>1.4 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.</p>	<p>See response to 1.4 d)</p>
<p>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.</p>	<p>Superannuation and other significant financial services are continuing to be investigated as part of the ABS's rolling review program, which ensures estimates are fit-for-purpose and representative. It is noted that financial services are particularly difficult to measure due to data availability and methodological challenges.</p>
<p>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).</p>	<p>In the absence of additional funding, the ABS has reprioritised and investigated the use of alternative data sources to enhance the quality of the CPI and enable more frequent re-weighting. From 2018, the CPI will be annually re-weighted using National Accounts HFCE data in inter-HES years.</p>
<p>1.7 To ensure a robust measure of the CPI, strategies to minimise possible sources of bias in the CPI will be</p>	<p>The ABS commenced a research program in 2015 aimed at enhancing the Australian CPI. As a result of</p>

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continued (e.g. the use of scanner data will be explored).	this program, the ABS is moving to annual re-weighting of the CPI and implementing multilateral methods for 28 ECs from the December quarter 2017. Both of these changes will enhance the representativity and quality of the CPI.
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.	The ABS updated the <i>Consumer Price Index: Concepts, Sources and Methods</i> publication (cat. no. 6461.0) in 2016 to include additional information on the quality adjustment process. This publication will be updated annually to incorporate changes in data sources, processes and methods.
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.	The ABS has invested considerable resources in investigating the use of scanner data. Scanner data is currently used to price products that represent approximately 25% of the weight of the CPI. Furthermore, the ABS will be introducing multilateral methods for 28 ECs of the CPI from December quarter 2017. This will result in a census of products being used from the scanner data and the weighting of prices at the product level, enhancing the quality of the CPI.
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.	Complete
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.	The ABS continues to engage and influence the international review of COICOP which is currently ongoing. Once this review is finalised, the ABS will investigate potential changes to the CPICC to align more closely with COICOP.
1.12 A correspondence between CPICC and the Input-Output Product Classification (IOPC) will be compiled and published for the 16th series CPI.	Complete
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.	Complete. No user requirements for seasonally adjusted indexes at the capital city level have been identified.
1.14 The ABS will publish an All groups excluding food and energy index as part of the analytical series, from	Complete

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the September quarter 2011.	
1.15 The ABS will update the tradable and non-tradable series classifications, from the September quarter 2011.	Complete. The tradable and non-tradable series classifications were updated in the September quarter 2011, and again in the December quarter 2016.
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.	Complete
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.	The ABS continues to engage with users as to how their lower level data requirements are best met.
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.	The data requirements to expand CPI coverage beyond the capital cities are being addressed through transactions data and webscraping.
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.	Since the 16th series, the ABS has investigated the need to develop and publish spatial price indexes. No user requirements for these indexes have been identified at present.
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.	As above

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