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# Experimental estimates of a Consumer Price Index for low-paid employee households

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Kelvin Yuen and David Rozenbes

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Research report 1/2022



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# Experimental estimates of a Consumer Price Index for low-paid employee households

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The contents of this paper are the responsibility of the authors and the research has been conducted without the involvement of members of the Fair Work Commission.

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- Australian Chamber of Commerce and Industry (ACCI);
- Australian Industry Group (Ai Group);
- Australian Council of Social Service (ACOSS);
- Australian Council of Trade Unions (ACTU);
- Australian Government; and
- State and territory governments.

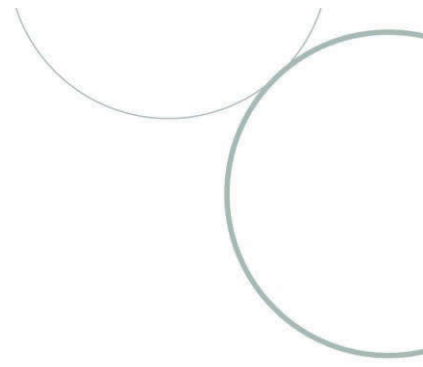
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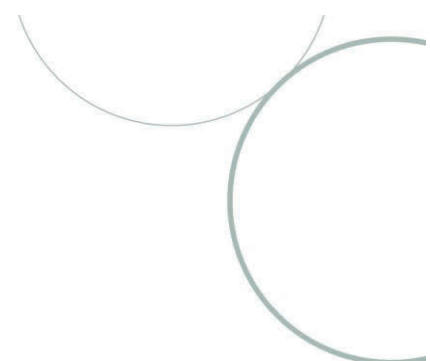
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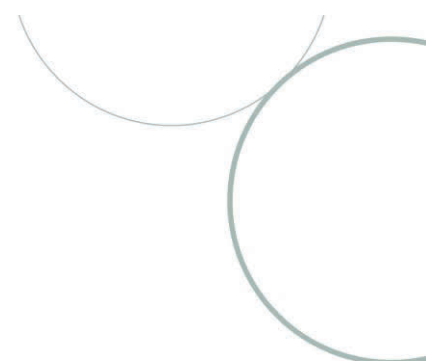


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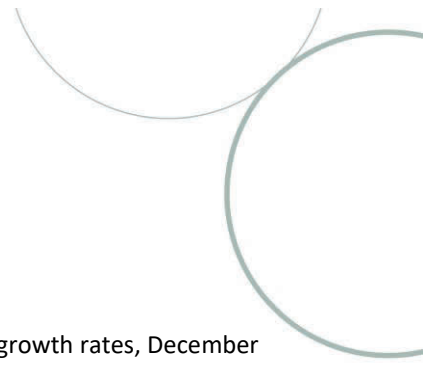


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# Abstract

This report estimates a measure of inflation and changes in the cost of living specific to low-paid employee households to determine if they differ from the published series. Following previous approaches undertaken in Australia, expenditure patterns of low-paid employee households are derived and the weights assigned to each item are applied to the prices data in the Australian Bureau of Statistics' Consumer Price Index and Living Cost Index for employee households. The differences in outcomes between the constructed measures for low-paid employee households and the published series are not found to be significant, with variation mainly attributable to changes in the prices of certain items, such as tobacco, mortgage interest and child care.





# 1. Introduction

The cost of living refers to the amount of money a household requires to maintain a certain living standard. As prices rise, the cost of living tends to increase. By comparing changes in incomes with changes in the cost of living, movements in living standards can be monitored over time. If incomes rise faster than prices, then living standards improve.

As part of the minimum wages and modern awards objectives, the Expert Panel for annual wage reviews (Expert Panel) must consider relative living standards and the needs of the low paid.<sup>1</sup> Relative living standards are often measured by comparing changes in wages or incomes for minimum wage workers or low-paid households with the average wage or income.

Changes in prices are generally measured by the Australian Bureau of Statistics' (ABS) Consumer Price Index (CPI), which is designed to provide a general measure of price inflation for households in Australian capital cities.<sup>2</sup> Changes in prices are therefore assumed to be the same across all households, even though household spending patterns may differ based on household characteristics (such as size, composition and income). The CPI is conceptually different to a measure of the cost of living, for which separate indicators are produced by the ABS for different groups in the community, including employee households. The Selected Living Cost Indexes (LCIs) reflect changes over time in the purchasing power of the after-tax incomes of households. The differences between the two measures are mainly in the goods and services considered and that the LCIs are calculated for particular households rather than for all households.

This report aims to measure the spending patterns of low-paid employee households and compare them with other households and is the first study to focus on this group using both the CPI and LCI. If they are different, then the CPI or LCI may not present an accurate reflection of the shifts in living standards for these workers or households. Given the broader use of the CPI in economic policy,<sup>3</sup> this paper develops an index based on both the CPI and LCI concepts for low-paid employee households. It does this by identifying the expenditure

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<sup>1</sup> *Fair Work Act 2009*, s.134(a) and s.284(1)(c).

<sup>2</sup> Inflation is specified in s.284(1)(a).

<sup>3</sup> In particular, by the Reserve Bank of Australia (RBA) to conduct monetary policy.



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patterns specific to low-paid employee households, who are a focus of the Expert Panel in its assessment on relative living standards (Fair Work Commission 2021a, Chart 8.7).

The research examines employee households receiving the lowest income. Two thresholds are used in the analysis—the bottom quintile, or households in the lowest 20 per cent of the income distribution, and a more restricted measure which examines households in the bottom decile or 10 per cent of the income distribution. Previous Australian studies have compared changes across the household income distribution by dividing all households into five quintiles. While studies have shown that the cumulative differences in inflation and the cost of living faced by lower and higher income households is small, there may be interest in short-term movements for the annual wage review.

The CPI and LCI for low-paid employee households calculated in this paper begin from the December quarter 2017. This was the first release to apply the most recent data on expenditure patterns of Australian households derived from the ABS Household Expenditure Survey (HES), which are a significant input to the calculation of the CPI. The findings show that, over the period to the December quarter 2021, there was little variation between inflation and cost of living outcomes for low-paid employee households and the published CPI and LCI series. Much of the difference can be explained by certain items—tobacco, mortgage interest and child care. Compared with previous research, this paper considers the impact of the COVID-19 pandemic.

The report is structured as follows. Chapter 2 discusses the concept of the CPI, provides a brief history and how it is constructed. Chapter 3 provides a summary of the differences between the CPI and LCI measures, while Chapter 4 discusses some of the limitations to price indexes. Chapter 5 reviews previous Australian studies and some international approaches. Chapter 6 discusses the methodology used to create the low-paid indexes and Chapter 7 analyses the results. Chapter 8 provides concluding remarks.



## 2. The Consumer Price Index

The CPI measures the changes in the price of a basket of goods and services. The Australian CPI is conducted each quarter and captures goods and services that account for a high proportion of expenditure by metropolitan households.<sup>4</sup> The reference population is private households<sup>5</sup> in the eight capital cities—comprising the six state capitals and the two territory capitals—and represents around two-thirds of Australian private households.<sup>6</sup>

The basket of goods and services represents the items notionally purchased each quarter by households. Price changes are based on the average prices collected from stores and households are assumed to have the same spending patterns in terms of the quantity and quality of items purchased. As prices of every type or variety of every item in all stores cannot be collected, the ABS uses purposive sampling that selects a representative set of goods and services measured from a representative sample of outlets (ABS 2019a, para. 7.4). The approach by the ABS is as follows:

*‘The goods and services included in the CPI pricing samples are selected carefully to represent the range of types and varieties of goods and services bought by the CPI population group. Selection is made only after obtaining detailed information about the buying habits of the CPI population group, such as which varieties and brands of products are the largest selling types or which packaging sizes are most commonly purchased. This process involves extensive consultations with, for instance, retailers, manufacturers, importers, government authorities, and professional and trade associations’.*

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<sup>4</sup> A household is a group of people who usually reside together. It may comprise one person or many.

<sup>5</sup> A private household is where people reside in a private dwelling. Those that reside in public dwellings, such as hotels, boarding houses, prisons, and university residences, are excluded from the CPI.

<sup>6</sup> While it would be ideal for the CPI to represent all Australian private households, the ABS explains that this is not feasible due to the additional costs involved in collecting prices outside the capital cities. See ABS (2019a), 5.20.



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The CPI measures price changes in items purchased by households for consumption. That means that expenditure by businesses and for investment purposes by households are out of scope. In addition, price changes for dwellings that move between households are excluded as they occur within the household sector.

Individual items are grouped based on similarity and substitutability with other items (ABS 2019a). The most detailed published level is the expenditure class. The 87 expenditure classes are based on the Consumer Price Index Commodity Classification (CPICC). Within these, 60 are classified as goods, accounting for around 53 per cent of the All groups CPI, and 27 as services, accounting for the remaining 47 per cent.

At the highest level, there are 11 groups:

- Food and non-alcoholic beverages;
- Alcohol and tobacco;
- Clothing and footwear;
- Housing;
- Furnishings, household equipment and services;
- Health;
- Transport;
- Communication;
- Recreation and culture;
- Education; and
- Insurance and financial services.

While the CPI is published quarterly, prices for items are collected at various times throughout a year. The prices for some items are collected more frequently if they are considered to be volatile (e.g. automotive fuel), while for others they are only collected once a year (e.g. property rates). According to the ABS (2019a, para. 8.20):

*The general approach is to price each item as frequently as is necessary to ensure that reliable measures of quarterly price change can be calculated.*



## 2.1 A brief history of price indexes in Australia

In response to increasing attention around a rise in the cost of living, the first Commonwealth Statistician initiated an enquiry into the cost of living which required volunteers to keep a detailed record of their expenditure. The 1907 Harvester Case was an important backdrop to this enquiry (ABS 2005). The first Retail Price Index report was published in 1912 and, despite being referred to as an index to measure the cost of living, its intention was only to measure 'price changes of an indicative range of representative items rather than cover every purchase made by an average household' (ABS 2005, p. 60). Soon after, price indexes developed by the then Commonwealth Bureau of Census and Statistics were used in wage cases based on the criteria established in the Harvester Case.

An important feature of measuring price changes for households (and the cost of living) is to not only develop a selection of goods and services consumed by households, but to also allocate a proportion or 'weight' to the amount of expenditure for each item. Following the recommendations of the Piddington Royal Commission in 1920, the basket was revised to reflect changes in consumption patterns. Over the next few decades, different forms of the index would be used in wage cases, with the Commonwealth Statistician 'regularly called before the court to explain and in some cases justify the choice of items and weights in the basket' (ABS 2005, p. 64). A 'Court' index was introduced in 1937 by the Commonwealth Court of Conciliation and Arbitration for use in quarterly adjustments to the basic wage, however, this index was discontinued in 1953.

With household expenditure patterns disrupted during and after World War II, the methodology for the price index had become unreliable. An approach was developed that would cope with the increasingly frequent changes in consumption patterns by linking short-term indexes.<sup>7</sup> This series became the Consumer Price Index and was first published in 1960, incorporating data back to the September quarter 1948. Creating a series of short-term indexes that could be linked enabled a single continuous measure of price changes. Each index had fixed weights, however, the short period between indexes allowed for regular updating to reflect contemporary standards (ABS 2017b).

The weighting of this new index was intended to estimate the aggregate expenditure of all wage-earner households, rather than of an average household. In the 1970s, the HES was developed and used as the basis

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<sup>7</sup> Now known as a chain linked index.



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for weighting the CPI from the December quarter 1976, and is still used today. The use of the HES also meant that different weights could be calculated for each capital city.

Frequent reviews of the CPI have led to small variations over time. The release of the September quarter 1998 data followed a substantial review that considered the conceptual aspect of the CPI, transforming it from a measure of the cost of living for employee households to a general measure of price inflation for all households. This was due to a range of factors, including the reduced role of the court-based system in wage-setting as enterprise agreements began to rise, as well as a change in monetary policy introduced by the Reserve Bank of Australia (RBA) towards inflation-targeting. Notably, this involved changes to the weights applied to household expenditure patterns in the capital cities, increasing the coverage of the CPI from 29 per cent to 64 per cent of Australian private households. Changes were also made to housing costs, leading to the development of separate living cost indexes by the ABS.

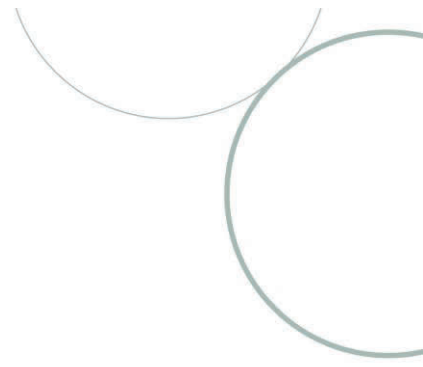
## 2.2 Constructing the Consumer Price Index

The current approach to developing and updating the CPI is to use the basket of items and assigned expenditure weights based on the HES. The weights represent the average expenditure of all households and are expressed as 'expenditure shares'. These represent the quantity of each item in the basket that remains fixed and only changes over time with the change in relative prices.<sup>8</sup>

As this survey is undertaken every 5 to 6 years, a recent approach adopted by the ABS has been to update the expenditure weights in the CPI on an annual basis using the Household Final Consumption Expenditure (HFCE) data from the National Accounts each December quarter (ABS 2019a).

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<sup>8</sup> ABS (2017b), para. 4.5.



### 2.2.1 Household expenditure survey

The HES collects data on household expenditure patterns from around 10 000 households (almost 8000 metropolitan households) (ABS 2017a). The latest release was for 2015–16.<sup>9</sup>

Respondents to the survey record their expenditure in a diary over a two-week period. Data on infrequently purchased or more expensive items are collected on a recall basis. Information is also collected on household characteristics.

The HES uses the Household Expenditure Classification (HEC) to categorise expenditure, of which there are 709 items. The ABS has developed a framework that matches the items of expenditure in the HES with the 87 expenditure classes in the CPI. For the majority of items, they can be exclusively categorised with an expenditure class in the CPI. For some, they are divided across CPI expenditure classes.

The majority of items in the CPI basket are sourced from the HES. Data from the HES are replaced by other data when these provide a more accurate estimate of expenditure.

### 2.2.2 Household financial consumption expenditure

Data from the National Accounts provide an opportunity to update the CPI expenditure weights more frequently than every 5 to 6 years. Frequent updates enable the CPI to be more contemporary and relevant for policymakers.

HFCE data from the National Accounts measures expenditure by households on goods and services and conceptually aligns with the HES.<sup>10</sup> HFCE measures the contribution to GDP from household consumption and is published both quarterly and annually. However, it is the annual data that is used to update the CPI.<sup>11</sup>

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<sup>9</sup> While the ABS were planning on conducting the HES for 2021–22, COVID-19 related restrictions have led to significant changes to household expenditure, such as international travel. As current patterns of household expenditure are unlikely to be sustained over the next few years, the ABS delayed the collection of data to 2023–24.

<sup>10</sup> The HES is used as a major benchmark in the compilation of the HFCE series. It contains the net expenditure on goods and services and expenditure of a current nature by private non-profit institution serving households, excluding expenditure by unincorporated businesses, expenditure on assets by non-profit institutions and expenditure on the maintenance of dwellings. See ABS, *Australian National Accounts: National Income, Expenditure and Product methodology*, June 2021.

<sup>11</sup> This is an internationally recommended approach when there is a large time interval between household surveys.



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Other data from HFCE is used in the compilation of the CPI, including the change in owner-occupied dwelling stock and other items relating to housing improvements, insurance, and information on motor vehicles (ABS 2017b).

### 2.2.3 Other sources

Information to derive the CPI is also obtained from other sources, including from outside the ABS, which makes it difficult to exactly replicate the weights of items in the basket. For instance:

- Information on private dwelling completions is obtained from data on Building Activity.
- Information on alterations and additions is from private gross fixed capital formation (GFCF) in the National Accounts.
- Financial services are separated into Deposit and loan facilities (direct charges) and Other financial services (ABS 2017b).
  - Expenditure on Deposit and loan facilities (direct charges) is obtained from administrative data from financial institutions and government reporting agencies.
  - Other financial services include real estate agent services, legal and conveyancing services, stockbroking services and taxes on property transfers (i.e. stamp duty). Real estate fees are obtained from ownership transfer costs in the National Accounts.
- Data on Higher Education Loan Program (HELP) payments 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.





## 3. Differences between the CPI and LCI

As noted above, the current methodology for the CPI has been published for more than two decades, however, it does not specifically measure changes in the cost of living. These are determined by changes in prices and the spending patterns of households, which can differ based on household characteristics such as income, size and location. This is measured by considering the amount of expenditure required to maintain a certain standard of living and is captured by the ABS through living cost indexes.

A living cost index measures changes in the purchasing power of after-tax incomes and is published by the ABS for several types of households: employee, age pensioner, other government transfer recipient, and self-funded retiree. In this report, the published LCI refers to the LCI for employee households.

The LCI is constructed using the 'outlays' approach which measures 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. This differs from the current CPI which uses the 'acquisition' approach, which measures changes in the prices of goods and services actually acquired in the period.

Some of the expenditure items in these measures, such as the purchase of durable goods, housing and financial services are also treated differently. For the CPI, housing consists of new dwellings purchased by owner-occupiers<sup>12</sup> (including additions to the housing stock), rents and major renovations. It is measured as the change in prices for the net purchase of housing and the increase in the volume of housing. This includes prices for new homes<sup>13</sup> (excluding the cost of land, which is considered an investment), major improvements

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<sup>12</sup> New dwellings purchased by owner-occupiers is the major component of Housing costs and household spending overall for the CPI population.

<sup>13</sup> It includes owner-occupied housing, first home owners' grants, alterations and additions, and installed appliances. Subsidies paid to first-home buyers are treated as negative expenditure and subtracted from the new dwelling purchase by owner-occupiers house acquisition expenditure.



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(i.e. renovations and extensions) and other costs (such as maintenance, council rates and utilities).<sup>14</sup> Changes to rents are only able to be measured for households residing in rented dwellings.<sup>15</sup>

Interest paid is not within scope of the CPI, only the prices that relate to the provision of banking services (as discussed in section 2.2.3). By including mortgage interest charges, changes to interest rates made by the RBA would directly affect the CPI.

The treatment of insurance in the CPI relates to the net value of the service provided by insurers to the household sector (gross premiums less claims).<sup>16</sup> Financial and insurance services in the CPI includes deposit and loan facilities provided by financial institutions as well as costs associated with the acquisition and disposal of real estate, such as stamp duty and real estate commission fees.

The LCI excludes the net purchase of housing and the increase in volume of housing due to renovations or extensions. Insurance in the LCI reflects the gross value of insurance premiums paid by households. Gross premiums are reported in the HES and are measured on an outlays basis and therefore used in the construction of the LCI (ABS 2017b). The treatment of financial services in the LCI includes mortgage interest (both changes in interest rates and debt levels on owner-occupied housing) and consumer credit charges but excludes all other financial services (e.g., deposit and loan facilities (direct charges), and other financial services).<sup>17</sup>

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<sup>14</sup> 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 from household purchases from other sectors (i.e. from businesses such as builders and developers).

<sup>15</sup> Maintenance of rented dwellings are paid by investors and therefore out of scope for the CPI.

<sup>16</sup> This is represented by the difference between the premiums paid and the claims received, otherwise known as the insurance service charge. This differs from the expenditure reported in the HES, which are the gross premiums paid by households.

<sup>17</sup> ABS (2021b); ABS (2021c).



## 4. Limitations to a price index

In the approach adopted by the ABS, the quantities of each item that form the CPI basket are fixed at the beginning of the period.<sup>18</sup> This can result in the measures of price changes overstating the true change in the cost of living (Garner et al. 1996). This is so because it is difficult to capture substitution between items purchased by households due to changes in relative price. This may be between different types of the same product or of similar items. Shifts in the consumption patterns of households may also come through changes to the stores in which the items are purchased, particularly if consumers are searching for cheaper products or services. That is, consumers will attempt to mitigate price increases on their cost of living by shifting their spending from higher inflation to lower inflation items (Jacobs et al. 2014). This results in an upward ‘substitution’ bias relative to changes in the cost of living. However, the more recent use of transaction data is likely to reduce the potential effects of substitution between items and enable weights to be updated more frequently, although the ABS acknowledge some issues with this approach (see ABS (2016); ABS (2019a)).

The ABS has previously estimated that between 1998–99 and 2015–16, the published CPI was overestimated by as much as 0.22 percentage points per year due to difficulties in considering the substitution effects (ABS 2019a). Jacobs et al. (2014) estimated substitution bias to be between  $\frac{1}{4}$  and  $\frac{1}{2}$  percentage point per year across a range of countries. As noted earlier, the CPI is comprised of short-term indexes linked over a longer period to take into account changes in consumption patterns. To reduce the impact more frequently, the ABS has used the HFCE to perform annual re-weighting of expenditure items since 2018.

However, this approach may not fully capture the responses of low-income households to relative price changes compared with other households, as the CPI assumes that all households purchase all of the items, and the same type of item (in terms of brands) from the same stores. If low-paid employee households purchase different items than those in the CPI basket, then it may not be representative of their expenditure patterns. It may be that these households respond differently by substituting between brands or stores, or even changes in quantities of items purchased.

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<sup>18</sup> It is a Laspeyres-type index, which measures the change in the cost of purchasing the same basket of goods and services in the current period, as was purchased in the base period.



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A further consideration is that, over time, adjustments need to be made to capture improvements to the quality of items. This is particularly the case with technological improvements (i.e. televisions, computers and mobile phones). If prices increase in line with quality, then the cost of living is unchanged. However, if prices are unchanged but quality improves, then the cost of living has declined. Therefore, quality improvements themselves may help to improve living standards.

Prices in the CPI are adjusted downward to account for the effect of quality improvements. The ABS makes around 2000 quality adjustments out of the 85 000 items priced in the CPI each quarter (ABS 2019c).

For certain items, measuring and adjusting for quality can be particularly difficult, such as for health and education, where the quality changes are less tangible than for many goods and there may be difficulties in identifying new items that should form part of the basket.

Finally, a further limitation is that the CPI is based on households in capital cities and captures prices for only a selection of goods and services. It is not designed to cover all types of expenditure, which would involve considerable resources.



## 5. Recent Australian research and international approaches

This research report considers whether changes in inflation and the cost of living are different between households based on income. This has previously been explored in Australia and the methodology in this report applies a similar approach to previous studies, with our focus on low-paid employee households. A summary of Australian and international literature was provided in van Kints and Breunig (2021). We have added to this by also including a discussion of a recent paper from staff at the United States' Bureau of Labour Statistics (BLS). Other countries' official statistical agencies publish a CPI for low-income households, and these are also discussed.

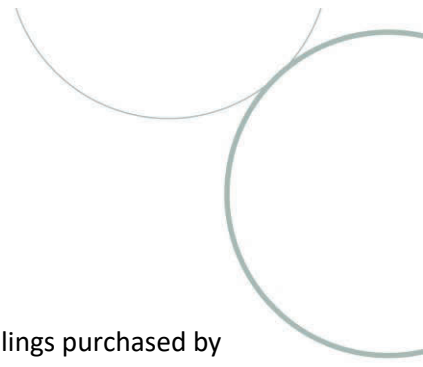
### 5.1 Australian studies

The most recent study in Australia, van Kints and Breunig (2021), found that inflation varied across households grouped by income between 2011 and 2018. The price indexes created in this study were compared with the headline CPI measure. The authors explained that an analysis of changes to real incomes using the headline CPI could overstate or understate actual changes in income without consideration of differences in the purchasing power of households with different income levels. According to the authors, low-income households (i.e., those in the bottom quintile of the income distribution) are found to spend a higher proportion of their income on necessities (food and transport) while high-income households spend more on transport, recreation and culture. The finding that expenditure patterns are different for households across the income distribution provides evidence for considering price indexes for different households.

The approach in this report is similar to that of van Kints and Breunig, who converted expenditure categories in the HES to match the CPI, and then used price changes measured in the CPI to examine changes across household quintiles from the September quarter 2011 to the September quarter 2018.<sup>19</sup>

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<sup>19</sup> This time period was chosen as it provides a consistent data series following a review into the CPI which was first implemented in the September quarter 2011.



For housing, van Kints and Breunig used a different approach to calculating new dwellings purchased by owner-occupiers than the CPI. While the CPI represents the total value of new dwellings purchased by owner-occupiers, in order to obtain estimates across household income, van Kints and Breunig allocated the total value of new dwellings purchased by owner-occupiers to each household income group using mortgage repayments data included in the HES. However, it was noted that this approach has limitations that could lead to either an overestimate or underestimate of inflation.

A second issue that was found is the treatment of alcohol and tobacco, which tends to be underreported. The HFCE measure was used to scale up the expenditure on this item reported in the HES for each income group.<sup>20</sup>

The paper found that expenditure on necessities is higher among low-income households. Spending on food and shelter comprised almost 45 per cent of all expenditure in 2015–16 compared with around 35 per cent for the highest income quintile. The highest inflation rate over the period was experienced by the lowest-income households (14.8 per cent) which was above the ABS measure of the CPI for the period (13.7 per cent). The lowest-income households also had the highest inflation rate for 5 of the 7 years examined. The research found that the main cause for the higher inflation experienced by the lowest-income households was due to increases in the prices of alcohol and tobacco. A rise in electricity prices and automotive fuel were also factors. These price increases were offset by relatively smaller price increases for food and non-alcoholic beverages, furnishings, household equipment and services, and recreation and culture. Low-income households were relatively less affected by expenditure on child care services. Inflation rates for the three middle-income groups were found to be similar over the period.

Removing alcohol and tobacco from the estimates found that the highest-income group had the highest inflation rate, while for the lowest income group it was around that of the aggregate CPI. The authors concluded that further research examining whether the product mix is different for households in different income quintiles would complement their results.

Prices faced by different household income groups was also examined by researchers at the RBA (Jacobs et al. 2014) who used a similar approach but with the inclusion of additional demographics, such as housing tenure, level of income, family structure, age and location. The approach to housing more closely matched the LCI by

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<sup>20</sup> Actual expenditure following adjustments using HFCE find that expenditure on alcohol and tobacco is almost double that reported in the HES.



using its mortgage repayment series, meaning that their derived measure was more similar to a measure of the cost of living. The period analysed was from 2003 to 2013.

The study found that differences in cost-of-living inflation was fairly small over the decade between household types, with differences having cumulated to no more than 6 percentage points across all household groups. In the short term, this study found that, less than 5 percentage points separated the inflation rates of the middle 80 per cent of capital city households for most years. The main cause being changes in interest rates (which would not affect the CPI). Changes in interest rates affect households with mortgages, and employee households are more likely to have a mortgage. Over the longer term, however, differences in the cost of living were found to have evened out and become affected by other shifts in expenditure patterns, such as education, health care and utilities.

The study also found that low-income households experienced slightly higher rates of inflation than high-income households. This was because they tend to spend proportionately more on items that are relatively 'essential' in their nature, such as housing and food, which resulted in them being more exposed to price increases in utilities. Higher-income households were found to spend a higher proportion on discretionary items and had benefited from lower price increases in motor vehicles, overseas travel and clothing during the period analysed. However, overall, the difference with higher-income households was found not to be large (around 4 percentage points).

In earlier research, Phillips et al. (2012) examined changes in the cost of living across a number of different households defined by their income levels, family type, age group, employment, tenure status and main source of income. Although the approach measured the impact of price changes to the out-of-pocket expenses of households and was therefore similar to the LCI compiled by the ABS, the study extended the measure to all households. From this, the NATSEM cost of living index was created.

The research defined the bottom 20 per cent of households to be low-income households and these households were found to spend a lower proportion of their expenditure on discretionary items. The research found that during the 2000s, all households were spending more on discretionary items and less on necessary items, as the price for most necessary items had reduced.

The research also did not find large differences in changes to the cost of living across households with different income levels between 1984 and 2011, with the difference between price growth for low-income and high-



income households found to be only 4.9 per cent. As with Jacobs et al. (2014), short-term differences were due to increases in mortgage costs.<sup>21</sup>

In fact, living standards were found to have increased across all household income quintiles and for those whose source of income was wages and salaries, as income growth outpaced the cost of living. Between 1984 and 2009–10, the two lowest income quintiles had the highest increase in their living standards. However, during the shorter time period between 2003–04 and 2009–10, the lowest-income quintile was found to have the lowest gain in living standards.

This analysis was updated in Phillips (2013). The study continued to find small differences in changes to the cost of living between households with different incomes, with higher-income households having the lowest increase in their cost of living between 1988 and 2013. Low-income households had higher growth in the cost of living in both the short (1 year) and long term (5 years). Households that rent had a higher increase in their cost of living than households with a mortgage, as interest rates fell over the period.

## 5.2 International evidence and approaches statistical agencies

A summary of international studies is provided in van Kints and Breunig (2021). Since then, one more recent paper in the US has compared the CPI outcomes of lower and higher-income households (Klick & Stockburger 2021). For this paper, households were measured by the bottom and top quartile of the income distribution.<sup>22</sup> Lower-income households were found to spend more on Food, Housing and Medical care, and less on Recreation, Education and communication, Apparel and Transportation. For most of the period between 2003 and 2018, annual growth for the lower-income households was found to be higher as they spent more on rent and energy (where prices rose faster during this period), and less on private transportation (where prices increased slower).

Several international statistical agencies produce a separate price index for specific household types, including a focus on low-paid households.

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<sup>21</sup> The approach applies the Reserve Bank's standard variable loan estimate to average housing loans data from the ABS to calculate average quarterly loan interest repayments for owner-occupier housing. An annual one per cent reduction is applied to this inflation measure to account for quality change.

<sup>22</sup> Income was measured before tax.





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The US BLS produces two measures of its CPI, one for all urban consumers (CPI-U) and another for the urban wage earners and clerical workers (CPI-W). The CPI-W is a subset of the CPI-U and is limited to the expenditure of households where more than half of the household's income is from clerical or wage occupations and at least one of the household's earners must have been employed for at least 37 weeks in the previous 12 months.<sup>23</sup> The CPI-W represents about 29 per cent of the US population (BLS 2021). The CPI-W is derived by adjusting the weights for various spending categories so that it reflects the spending habits of the wage earner population and is used to calculate some social security cost-of-living adjustments (Reed and Steward 2014).

Items in the CPI-W that have a higher expenditure weight than the CPI-U are Food and beverages, Apparel, Transportation, and Other goods and services. Housing, Medical care, Recreation, Education and communication have a lower expenditure weight (BLS 2018). Analysis of annual growth rates shows the two series have closely tracked each other over time. While annual growth in the CPI-W was higher in 2021, it was lower than the CPI-U in 2015 and 2016 (BLS 2022).

A CPI across household income is also published in Singapore, with indexes derived for the bottom 20 per cent, middle 60 per cent and top 20 per cent. These data are produced for a 6-month period. When compared with the published CPI, annual growth for the bottom 20 per cent has followed similar trends (SingStat 2021).

The Philippines Statistics Authority calculates a monthly index for the bottom 30 per cent of household income in its published series. Annual inflation for these households has mostly been higher than for all households during 2020 and 2021 (Philippine Statistics Authority 2021).

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<sup>23</sup> The CPI-W is the oldest measure of inflation calculated by the US Bureau of Labor Statistics (Klick & Stockburger 2021).



## 6. Methodology

While using slightly different approaches, the studies discussed in the previous section each used appropriate methodologies for calculating price or cost-of-living changes across household income. For this study, it was decided that indexes for low-paid households could be created based on both the CPI and LCI. As the focus of the Expert Panel tends to be on employee households, both measures were restricted to this group.

This report uses data collected and compiled by the ABS. As detailed expenditure on goods and services from the HES are required, ABS microdata were used for the analysis. Also, unlike the previous studies which examined periods prior to the ABS introducing yearly updates to the weights, this paper applies the results of the annual re-weighting of expenditure items in both the CPI and LCI using the HFCE.<sup>24</sup>

### 6.1 Low-paid Consumer Price Index

A low-paid CPI is constructed by tracking the inflation outcomes for goods and services based on the purchasing habits of low-paid employee households. Employee households are defined as households where the main source of current household income is from employee income. In this paper, two measures of low-paid employee households are used—bottom quintile and the bottom decile of equivalised household disposable income.<sup>25</sup> In total, there were 860 metropolitan households analysed for the quintile measure and 430 metropolitan households for the decile measure.

Goods and services purchased by low-paid employee households are weighted by the amount of weekly expenditure accounted for by each item. While expenditure categories between the HES and the CPI are not the same, the ABS publishes a document that allows users to convert items in the HES into items used in the CPI (ABS 2018). In the 2015–16 HES, there were 709 expenditure categories in the HEC which match up to the 87 categories in the CPICC.

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<sup>24</sup> The annual re-weighting of expenditure items using the HFCE is undertaken by the ABS and the underlying data are not published. In this report, the weights for low-paid employee households are updated based on the percentage change in the weights of the published CPI/LCI for all/employee households.

<sup>25</sup> Calculations based on a smaller sample potentially increases sampling error.



The fact that there are many more items in the HEC than the CPICC leads to issues when matching up categories. The concordance document published by the ABS does not provide enough detail on how expenditure classes match up when there is not a perfect one-to-one match. For example, one HEC category may match up to multiple CPICC categories, or one CPICC category may match up to multiple HEC categories. Fortunately, unpublished information was provided by the ABS that allowed for the matching of some of these more difficult categories.<sup>26</sup>

As previously noted in Section 2.2, the ABS make adjustments to the HES expenditure data so that it provides a more accurate picture of expenditure. This includes adjustments to alcohol and tobacco (due to under-reporting),<sup>27</sup> as well as expenditure on items that have a recall period of 12 months, such as motor vehicle registrations, overseas holiday travel and education (ABS 2017b).

In addition, some expenditure data used in the CPI are not obtained from the HES, such as new dwelling purchases by owner-occupiers, motor vehicles, higher education loan program, insurance, financial services, deposit and loan facilities (direct charges) and other financial services.

It is not possible to make adjustments for all of these issues when constructing a CPI for low-paid employee households because these data are either not publicly available or cannot be disaggregated by household income to determine their importance for low-paid employee households.

Similar to the approach of van Kints and Breunig (2021), the following adjustments are made to categories where the HES data provided significantly different weekly expenditure outcomes compared with the CPI:

- While Housing accounts for the highest proportion of expenditure by all households in the CPI, data on new dwelling purchases by owner-occupiers across the household income distribution are not available, meaning that it is not possible to replicate the same approach as the CPI.<sup>28</sup> This report follows the approach used in van Kints and Breunig (2021) where this is estimated by allocating the total value of

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<sup>26</sup> These data are available from the ABS on request.

<sup>27</sup> 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.

<sup>28</sup> The CPI calculates this by multiplying the average value of private dwelling completions (from the ABS Building Activity survey) by the change in owner-occupied housing stock (from the ABS National Accounts).



new dwellings purchased by owner-occupiers to low-paid employee households utilising mortgage repayments data (for selected dwellings) from the HES.

- The total value of new dwellings purchased by owner-occupiers is calculated by using the difference between the HES expenditure for ‘New dwelling purchase by owner-occupiers’ with the CPI weekly expenditure of the same category and allocated across households based on their total mortgage repayments for selected dwellings (principal and interest).
- For alcohol and tobacco, insurance and motor vehicles, expenditure in the HES is scaled to match expenditure in the CPI, as these data are taken from the HFCE.
- Low-paid employee households are assumed to spend the same proportion of their total expenditure on financial services as all households in the CPI.

## 6.2 Low-paid Living Cost Index

Using the same two measures of low-paid employee households—the bottom quintile and the bottom decile of equivalised household disposable income—a low paid living cost index is developed to show whether cost of living outcomes for these households are different to all employee households.

The expenditure shares for the LCI are created by making adjustments to expenditure shares constructed for the CPI. These are:

- removing ‘new dwelling purchase by owner-occupiers’;
- removing the adjustment to insurance categories for the CPI and instead using the insurance expenditure as collected in the HES; and
- removing the financial services component. This is replaced by the sum of the following HES categories: mortgage repayments—interest component (selected dwelling), interest payments on credit card purchases, and interest payments on credit card cash advances.

## 6.3 How income is measured

To identify low-paid employee households, we use a measure of household income derived from the ABS, Survey of Income and Housing. This survey is conducted every two years and was integrated with the HES in 2015–16. The final sample contained more than 14 000 households representing almost 27 000 people.



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Income consists of current weekly income, defined as ‘all current receipts, whether monetary or in kind, that are received by the household or by individual members of the household, and which are available for, or intended to support, current consumption’ (ABS 2019b).

A distribution of household income ranks the income of all households from lowest to highest. This report only considers employee households, i.e. those whose main source of income is from wages and salaries. Two definitions of low-paid employee households are used—the bottom 20 per cent (quintile) and bottom 10 per cent (decile) of households in the income distribution.

Household income distribution is based on disposable income, as this takes into account income lost to taxes (and the Medicare levy) and income gained through government transfers (such as Family Tax Benefit) and therefore ‘better represents the economic resources available to meet the needs of household’ (ABS 2019b). Disposable income is also adjusted for household size using an equivalising factor, thereby enabling a better comparison between household types (‘equivalised income’).



## 7. Analysis

This section presents the results from the experimental estimates of the CPI and LCI indexes for the two measures of low-paid employee households—the bottom quintile and bottom decile of equivalised household disposable income. First, it compares the expenditure patterns of low-paid employee households with households sampled in the published CPI and LCI to determine differences in spending patterns. These expenditure patterns are then used to create the indexes for the low-paid employee households. The analysis concludes by presenting alternative measures of real wages growth using the derived low-paid CPI and LCI.

### 7.1 Expenditure weights for low-paid employee households

As discussed earlier, expenditure weights represent the proportion of the household budget spent on various items. These are examined because they may differ between low-paid employee households and other households, and may lead to differences in low-paid CPI/LCI outcomes relative to the published series.

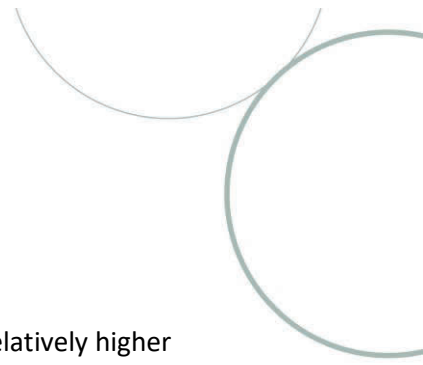
#### 7.1.1 Expenditure weights for low-paid employee households in the CPI

Expenditure weights at the September quarter 2017 are used to derive both measures of low-paid employee households and are compared with those for all households as published in the CPI release at the expenditure group level (Table 7.1). This represents the beginning of the period of analysis and before annual adjustments to the expenditure weights using the HFCE have been applied.<sup>29</sup> The proportion of spending for each expenditure group is fairly similar between the low-paid employee households and that of all households.

When compared with all households in the published CPI, both measures of low-paid employee households spend a higher proportion of expenditure on Food and non-alcoholic beverages, Housing, Health, Communication and Education and a lower proportion on Recreation and culture, Alcohol and tobacco, Furnishings, household equipment and services, and Transport.

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<sup>29</sup> Expenditure weights are presented at the September quarter 2017 as they are based on the 2015–16 HES and likely to represent a more reliable snapshot of the expenditure patterns of low-paid employee households. Appendix A – Table A3 provides expenditure weights updated to the September quarter 2021 using data from the HFCE.



Most of these outcomes are as expected. Lower-paid employee households have a relatively higher expenditure on essentials (Food and non-alcoholic beverages<sup>30</sup> and Housing) and a relatively lower expenditure on leisure activities (Recreation and culture). Some differences may also be due to the focus of this analysis on employee households. For example, expenditure on Education is higher among low-paid employee households,<sup>31</sup> potentially due to the exclusion of non-employee households, such as retirees, who are less likely to be studying.

**Table 7.1: CPI expenditure weights for all households and low-paid employee households**

	Low paid CPI (quintile)	Low paid CPI (decile)	All households published CPI
	(%)	(%)	(%)
Food and non-alcoholic beverages	17.4	17.9	16.1
Alcohol and tobacco	6.4	5.2	7.1
Clothing and footwear	3.3	3.8	3.6
Housing	24.1	23.2	22.7
Furnishings, household equipment and services	8.6	9.1	9.4
Health	5.5	6.5	5.4
Transport	10.1	9.1	10.3
Communication	3.1	3.2	2.7
Recreation and culture	11.0	10.6	12.7
Education	4.6	5.7	4.3
Insurance and financial services	5.7	5.8	5.8
	100.0	100.0	100.0

Note: Measured at September quarter 2017.

Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS (2017b).

Expenditure weights presented at a finer level of detail for both the CPI and LCI are shown in Appendix A. Analysis of the detailed expenditure data (for the 87 categories) provides further explanation for the differences in expenditure between all households and low-paid employee households. For instance, the

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<sup>30</sup> When Restaurant meals and Take away and fast foods are removed from this group, the difference is even larger.

<sup>31</sup> Low-paid employee households spend more on Preschool and primary education and Secondary education, and also for Tertiary education when using the decile measure.



analysis shows that a higher proportion of expenditure on Housing for both measures of the low-paid CPI for employee households is largely due to a higher proportion of expenditure being spent on rent and electricity (Table A1). Research has found that low-paid employee households are less likely to own a house,<sup>32</sup> and therefore more likely to spend a higher proportion of their expenditure on rent rather than on purchasing a new home or on renovations.<sup>33</sup>

The detailed data also show that both types of low-paid employee households spend more on automotive fuel and less on motor vehicles (more so for the decile measure) and discretionary items such as wine, restaurant meals, holiday travel and accommodation (both domestic and international) compared with all households in the published CPI.

To check how accurately the approach in this study compares with the published CPI, Table A1 also presents the expenditure weights derived for all households (not just low-paid) with the expenditure weights applied in the published CPI. These appear to match closely, which suggests that the methodology used in this study to create the expenditure weights is appropriate for the purpose of this research.

### **7.1.2 Expenditure weights for low-paid employee households in the LCI**

Applying the same analysis, Table 7.2 compares the spending patterns for low-paid employee households with employee households in the published LCI.<sup>34</sup> Again, the spending patterns are fairly similar between the three groups. Compared with all employee households in the published LCI, both types of low-paid employee households spend a higher proportion of their expenditure on Housing, Food and non-alcoholic beverages, Health, Communication and Education and a lower proportion of their expenditure on Alcohol and tobacco, Furnishings, household equipment and services, Recreation and culture and Insurance and financial services.

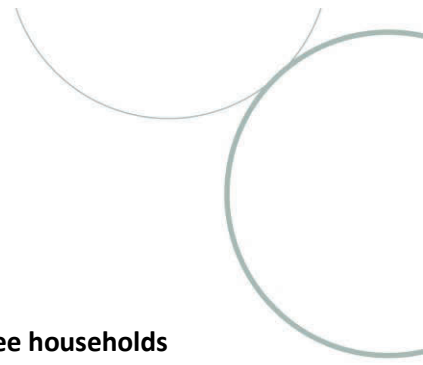
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<sup>32</sup> According to the Household, Income and Labour Dynamics Australia Survey in 2019, 50.5 per cent of low-paid employee households (bottom quintile) own a home or are currently paying off a mortgage, compared with 68.3 per cent for higher-paid employee households. For further information on this, see Fair Work Commission (2021b).

<sup>33</sup> New dwelling purchase by owner occupiers include owner-occupied housing, first home owners' grants, alterations and additions, and installed appliances (ABS, *Consumer Price Index: Concepts sources and Methods*, 2018, 6.26).

<sup>34</sup> Expenditure weights are presented at the September quarter 2017 as they are based on the 2015–16 HES and likely to represent a more reliable snapshot of the expenditure patterns of low-paid employee households. Appendix A – Table A4 provides expenditure weights updated to the September quarter 2021 using data from the HFCE.





**Table 7.2: LCI expenditure weights for employee households and low-paid employee households**

	Low paid LCI (quintile)	Low paid LCI (decile)	All employee households published LCI
	(%)	(%)	(%)
Food and non-alcoholic beverages	17.8	17.9	16.9
Alcohol and tobacco	6.6	5.2	7.5
Clothing and footwear	3.4	3.8	3.8
Housing	18.7	19.3	14.8
Furnishings, household equipment and services	8.8	9.1	9.9
Health	5.6	6.5	5.4
Transport	10.3	9.1	10.2
Communication	3.2	3.2	2.7
Recreation and culture	11.2	10.6	13.1
Education	4.7	5.7	4.3
Insurance and financial services	9.8	9.6	11.4
	100.0	100.0	100.0

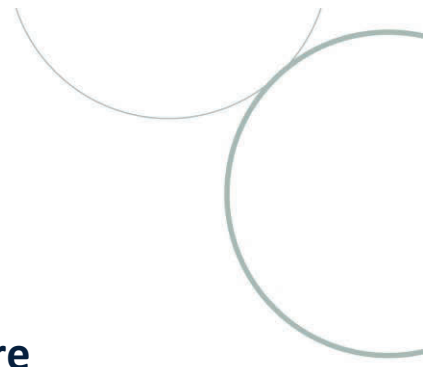
Note: Measured at September quarter 2017.

Source: ABS, *Microdata: Household Expenditure, Income and Housing*, 2015-16; ABS, *Selected Living Cost Indexes, Australia*, Dec 2017, Explanatory notes.

In a detailed examination of the expenditure weights, differences in expenditure on Housing were found to be larger between low-paid employee households and the published LCI (3.9–4.5 percentage points) than for the CPI (0.5–1.4 percentage points). This is because the LCI does not include expenditure on new dwelling purchases by owner-occupiers, and low-paid employee households spend a lower proportion of their expenditure on new dwelling purchases as reflected in the CPI. Low-paid employee households also spend less on Insurance and financial services, such as mortgage interest, as they are less likely to own a house and have a mortgage (Table A2).

Similar to the CPI, expenditure by both types of low-paid employee households was higher on Education. However, unlike for the CPI, the differences were mainly driven by higher spending in Tertiary education.

The expenditure weights generated from this analysis for all employee households are found to be similar to the expenditure weights produced for the published LCI for all employee households, confirming the robustness of the methodology, although the differences are slightly larger than comparisons with the CPI.



## 7.2 Non-discretionary and discretionary expenditure

The ABS categorises the 87 expenditure categories based on the CPICC into those that are essential (or non-discretionary) and those considered discretionary. We apply this categorisation to analyse whether low-paid employee households spend more on essential or non-discretionary items relative to all/employee households.

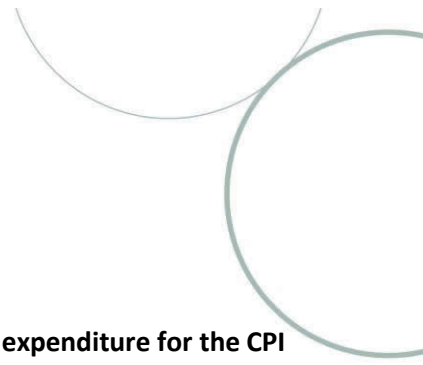
The ABS define non-discretionary expenditure as goods or services that are purchased because they meet a basic need (food, shelter, healthcare), are required to maintain current living standards, or are a legal obligation. Discretionary expenditure includes goods or services that could be considered as ‘optional’ purchases (ABS 2021a).

While the ABS has not specifically undertaken this form of analysis using the expenditure categories used to determine the LCI measure, the same methodology can be applied given the significant overlap between the CPI and LCI. However, as expenditure on mortgage interest and consumer credit is not considered in the measure of the CPI, these categories have not been classified as either discretionary or non-discretionary by the ABS. Nevertheless, for the purpose of this analysis, these categories are classified as non-discretionary expenditure, as they fall within the ‘legal obligation’ category defined as non-discretionary.

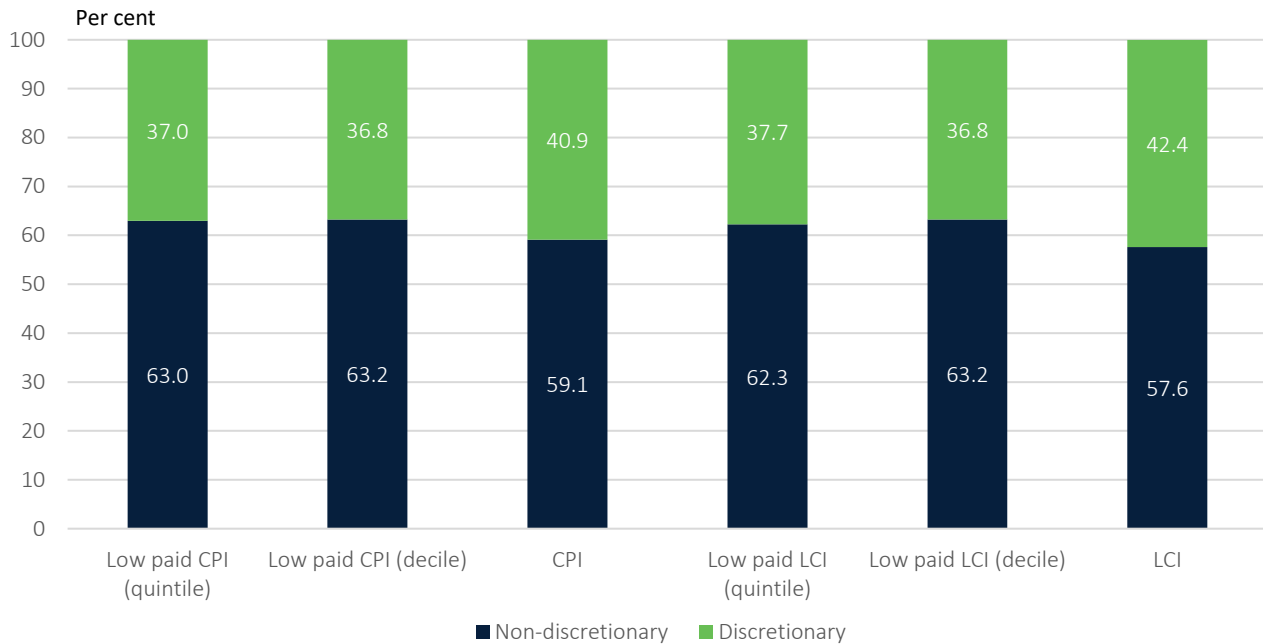
Chart 7.1 shows the proportion of non-discretionary and discretionary expenditure using the CPI and LCI for both types of low-paid employee households compared with the published CPI and LCI.<sup>35</sup> Non-discretionary expenditure accounted for around 63 per cent of total expenditure for both measures of the low-paid CPI, which is higher than for the published CPI (59.1 per cent). Similarly, the proportion of expenditure on non-discretionary items was also higher for the measures of the low-paid LCI (around 62–63 per cent) than the published LCI (57.6 per cent), showing that low-paid employee households have higher expenditure on essential or non-discretionary items than average.

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<sup>35</sup> Appendix A—Chart A1 presents these data updated to the September quarter 2021, which show similar outcomes.



**Chart 7.1: Non-discretionary and discretionary expenditure as a proportion of total expenditure for the CPI and LCI, low-paid employee households, September quarter 2017**



Note: These data are presented as at the September quarter 2017 as this is when the published CPI and LCI expenditure weights were updated using the 2015–16 HES.

Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015-16*; ABS (2017b); ABS, *Selected Living Cost Indexes: 17<sup>th</sup> Series Weighting Pattern, Sep 2017*.

## 7.3 Trends in inflation and cost of living for low-paid employee households

Using the expenditure weights derived in the previous section, indexes can be calculated for inflation and the cost of living specific to low-paid employee households and can be compared with the published measures of the CPI and LCI.

Variation between the low-paid and published measures may not only be due to the different spending patterns on goods and services identified in the previous section, as the measures also reflect changes in the prices of goods and services over time. Therefore, the expenditure weights for low-paid employee households only show the *potential* for variation in inflation and cost of living outcomes.



For example, while low-paid employee households spend a higher proportion of expenditure on rent, small changes in rental prices may not result in a measurable difference between the price changes for low-paid employee households and the published measures. Therefore, it is the combination of differences in both the expenditure weights as well as price movements that drive differences between the measures. This is examined further in section 7.3.3.

### 7.3.1 Annual changes in the low-paid CPI and LCI

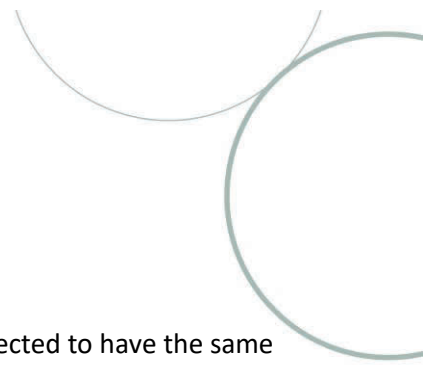
Chart 7.2 compares the annual growth rates for both measures of the low-paid CPI for employee households with the published CPI between the December quarter 2018 to December quarter 2021. During this period, published CPI growth peaked at 3.8 per cent over the year to the June quarter 2021. Growth for the low-paid CPI measures was lower, at 3.6 per cent for the bottom quintile and 3.3 per cent for the bottom decile of employee households. For the decile measure, the peak occurred in the December quarter 2021.

Annual growth rates for both measures of the CPI for low-paid employee households tracked closely to the published CPI between the December quarter 2018 and June quarter 2020. However, annual growth rates for both measures of the CPI for low-paid employee households were lower than the published CPI after the September quarter 2020 (although the quintile measure gradually converged towards the published CPI by the September quarter 2021). The differences between the decile and quintile measures were partly driven by the lower expenditure weight for tobacco for the bottom decile of low-paid employee households. Tobacco prices were affected by the annual excise tax increase of 12.5 per cent and the bi-annual excise tax increase based on Average Weekly Ordinary Time Earnings indexation in the December quarter 2020 (ABS 2020).<sup>36</sup> Expenditure items considered to be volatile and have a significant influence on inflation outcomes are removed from the low-paid and published measures at Appendix B. When expenditure on tobacco is excluded, annual growth rates for both measures of the CPI for low-paid employee households followed each other closely and have remained slightly below the published CPI since the September quarter 2020 (Chart B2).<sup>37</sup>

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<sup>36</sup> While the annual excise tax increase and bi-annual excise tax increase occurs on 1 September, the largest effects on tobacco prices occur in the December quarter.

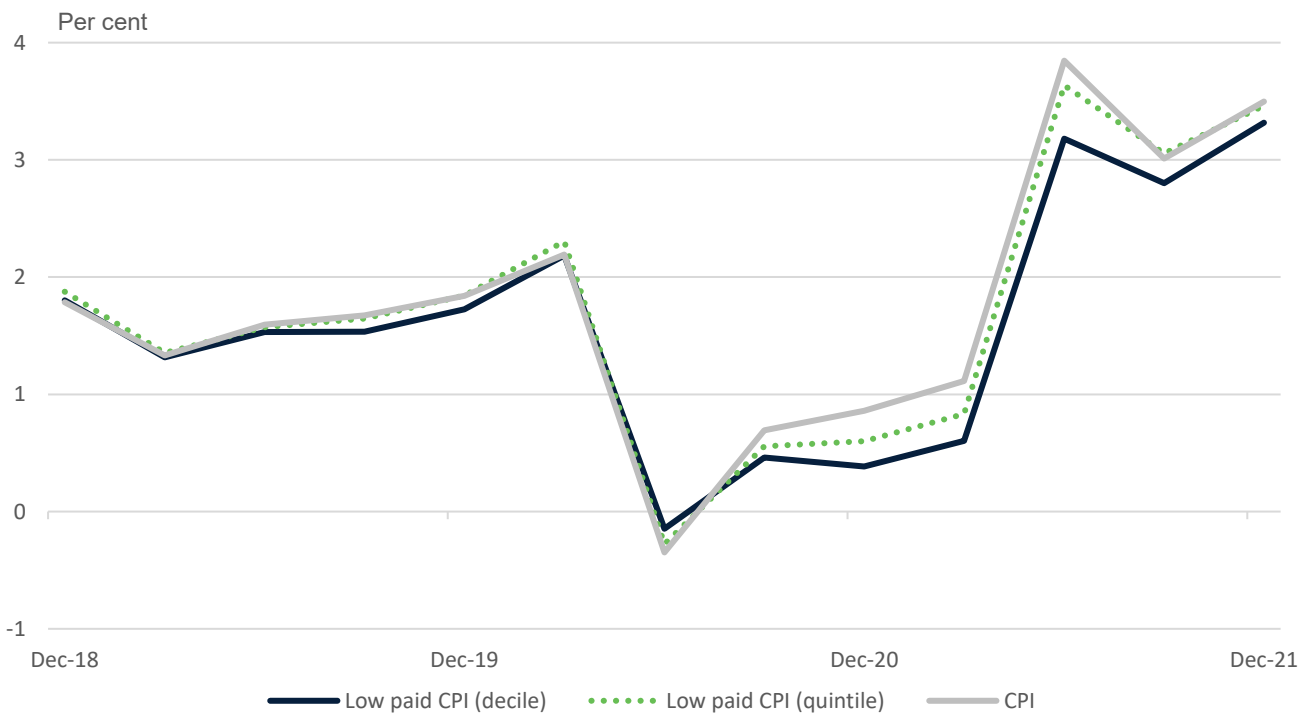
<sup>37</sup> This outcome is similar to van Kints and Breunig.



Assuming no further policy adjustments, changes in tobacco prices would not be expected to have the same effect on driving differences between the low-paid CPI and the published CPI in the future, as the annual 12.5 per cent increases to the tobacco excise finished in 2020 (Department of Health 2018).

Annual CPI growth for the low-paid employee households was higher than the published CPI in the June quarter 2020 and lower in the June quarter 2021, particularly for the bottom decile. This was due to the unwinding of free child care introduced in the June quarter 2020, and the lower expenditure weight applied to child care in the low-paid CPI measures.<sup>38</sup> Excluding child care, annual growth in the low-paid CPI for employee households in the bottom decile tracks closely with the low-paid CPI for employee households in the bottom quintile and the published CPI over the year to the June quarter 2021 (Chart B6).

**Chart 7.2: Published CPI and CPI for low-paid employee households, annual growth rates, December quarter 2018 to December quarter 2021**



Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia*, December 2021.

<sup>38</sup> ABS, *Consumer Price Index, Australia*, June 2021.



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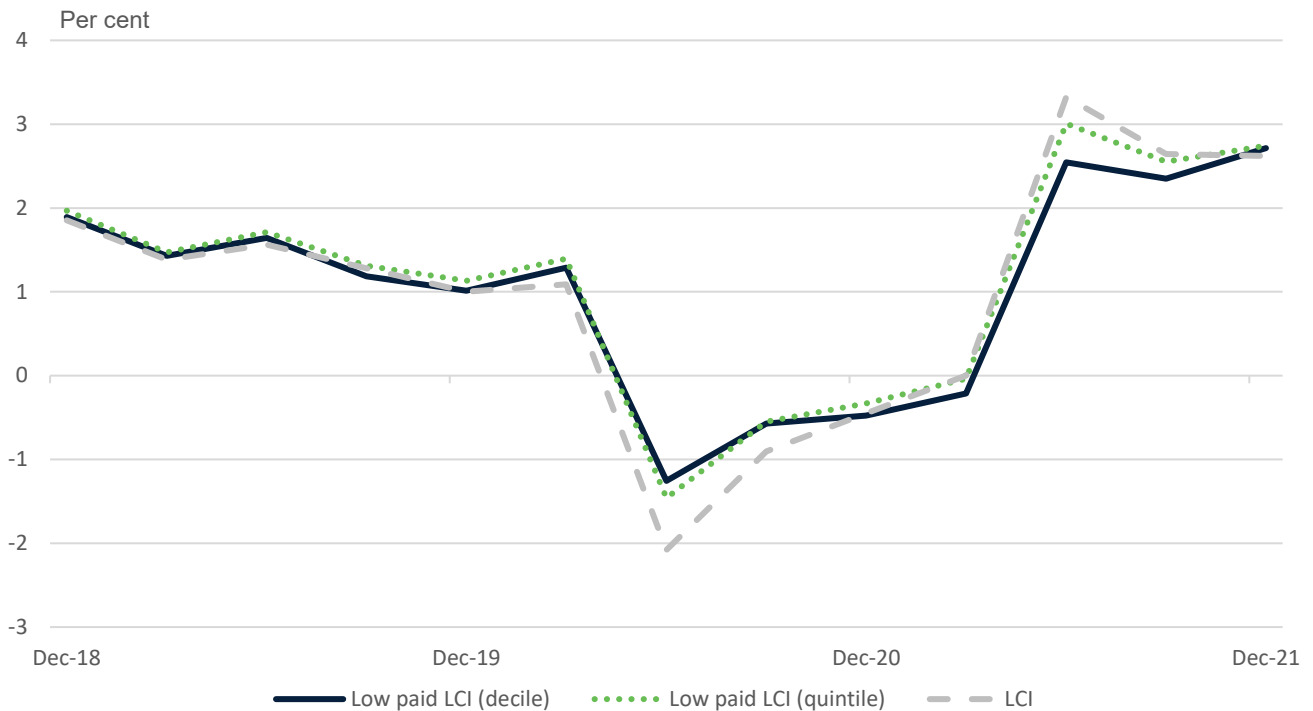
Annual growth rates for both measures of the low-paid LCI tracked relatively closely to the published LCI between the December quarter 2018 and the December quarter 2019. Annual growth in the LCI for employee households peaked at 3.3 per cent over the year to the June quarter 2021, while growth was lower for the low-paid households, at 3.0 per cent for the bottom quintile and 2.7 per cent for the bottom decile of households. For the bottom decile measure, the peak was in the December quarter 2021 (Chart 7.3).

However, annual growth rates for both measures of the low-paid LCI were higher than the published LCI between the March quarter 2020 and September quarter 2020, reflecting the lower proportion of low-paid employee households affected by mortgage interest, which fell significantly during this period.

For the June quarter 2021, annual growth rates for both measures of the low-paid LCI were below the published LCI, particularly for the bottom decile. This was due to the unwinding of free child care and the lower expenditure weights for child care across the low-paid LCI measures. When excluding child care, growth for both measures of the low-paid LCI tracked closely, and were both above the published LCI in the June quarter 2021.



**Chart 7.3: LCI for low-paid employee households, annual growth rates, December quarter 2018 to December quarter 2021**



Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

### 7.3.2 Cumulative growth in the low-paid CPI and LCI

Differences in growth rates are also evident over the full period of analysis. Chart 7.4 shows the cumulative changes in the CPI and LCI for low-paid employee households compared with the published series between the December quarter 2017 and the December quarter 2021. Both low-paid household indexes track the published measures quite closely.

The published headline CPI increased by 8.2 per cent over this period. The CPI for low-paid employee households measured as the bottom quintile tracks the published CPI across the whole period, increasing by 8 per cent. However, the CPI for low-paid households in the bottom decile increased by only 7.4 per cent over this period. The shift in the series occurs in the second half of 2020 and is driven by the increase in tobacco prices in the December quarter 2020 (ABS 2020).



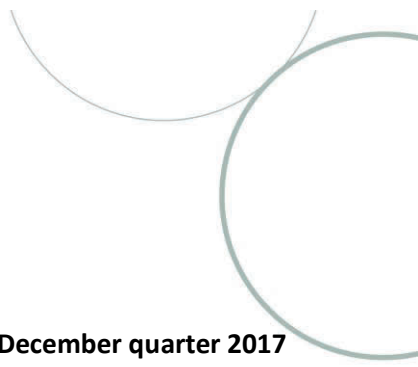
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Unlike the CPI, growth in the LCI for low-paid households was higher than the published series. While the published LCI increased by 5.1 per cent over the period, the increases were higher for low-paid households in the bottom decile (5.2 per cent) and in the bottom quintile (5.6 per cent).

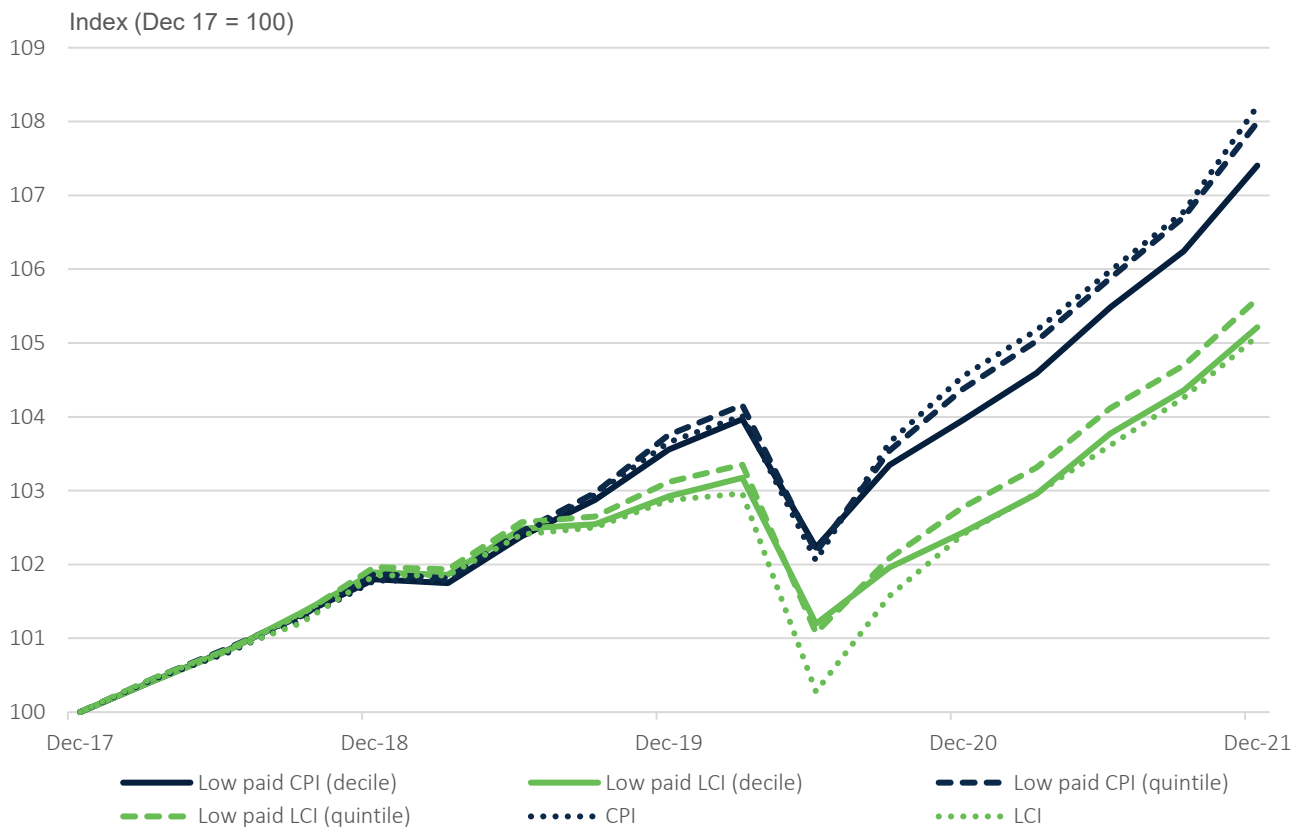
Both measures of the LCI for low-paid employee households began to deviate from the published LCI in 2020. This coincided with the period when the RBA was reducing interest rates (from 0.75 per cent to 0.25 per cent). Excluding mortgage interest shows that the low-paid measures of the LCI closely followed the published LCI (and all of these measures closely tracked the published CPI), suggesting that mortgage interest charges was the primary driver of the difference in outcomes between the published LCI and the CPI (Charts B3 and B4).

A further difference between the low-paid LCI for the bottom quintile is due to the higher expenditure on tobacco. When tobacco is excluded, both measures of the low-paid LCI and the published LCI track closely with each other after the December quarter 2020 (Chart B1).





**Chart 7.4: CPI and LCI for low-paid employee households, cumulative growth rates, December quarter 2017 to December quarter 2021**

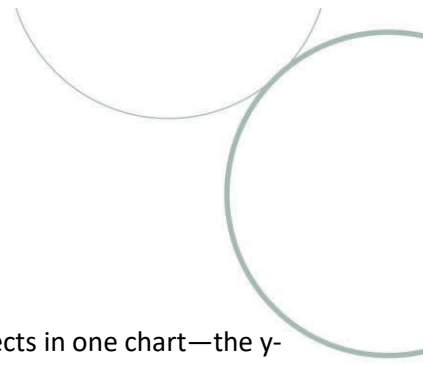


Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

Further analysis of the trends in inflation and the cost of living for the 11 major expenditure groups is at Appendix C. The analysis shows the effects of the main drivers discussed earlier (i.e., mortgage interest, child care, and tobacco) on inflation and cost of living outcomes for low-paid employee households and other households for the relevant expenditure group.

### 7.3.3 Effects of expenditure and price changes

As noted earlier, variation in inflation or cost of living outcomes between low-paid employee households and the published series can be due to the different expenditure patterns (or weights) for goods and services and the change in prices of those items, as the weights assigned to each item are applied to data on prices.

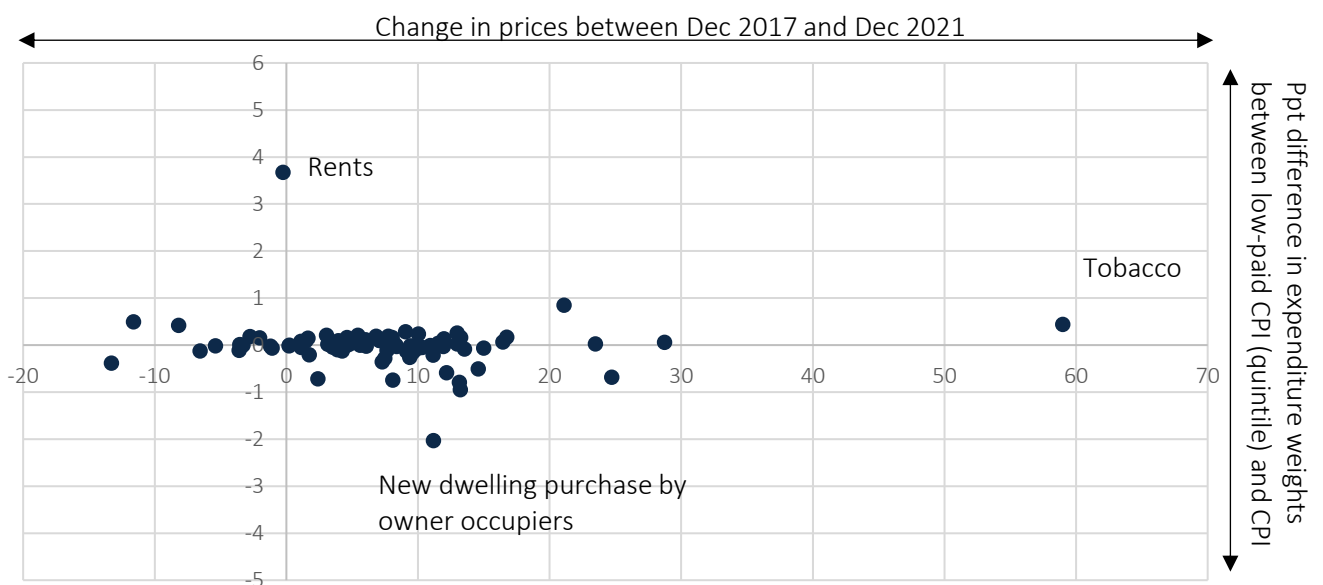


Based on the quintile measure of the low-paid CPI, Chart 7.5 presents these two aspects in one chart—the y-axis shows the difference (in percentage point terms) in the expenditure weights assigned to the CPI for low-paid employee households relative to the published CPI, and the x-axis shows the change in prices between the December quarter 2017 and December quarter 2021 for all 87 expenditure categories based on the CPICC items.

The chart highlights the main items that have led to the difference in outcomes. The chart shows that while the difference in expenditure on tobacco between low-paid employee households and all households is not large, the effect of the price change of tobacco between the two measures is significant.

Conversely, the chart also shows that while low-paid employee households spend a significantly higher proportion of their expenditure on rents (and a lower proportion on new dwelling purchases for owner-occupiers), price changes on these categories remained relatively stable over the period, limiting its overall effect on low-paid outcomes and therefore the difference between the two measures of inflation. Appendix D presents this analysis for the remaining measures.

**Chart 7.5: Percentage point differences in the low-paid CPI (quintile) expenditure weights relative to the CPI, and CPI change between December quarter 2017 and December quarter 2021, by expenditure class**





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Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*.

## 7.4 Measures of real minimum wages

The derived low-paid CPI and LCI can be used as an alternative measure of real changes in the National Minimum Wage (NMW). Chart 7.6 compares these measures with the published CPI and LCI for employee households between the December quarter 2017 and the December quarter 2021.

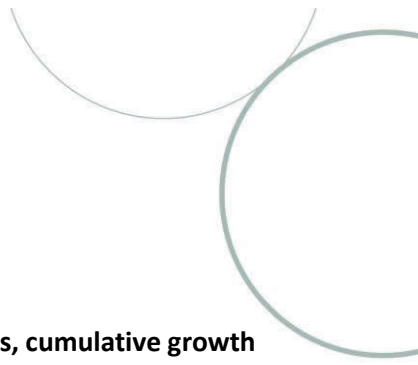
The chart shows that growth rates for the real NMW using all measures of the LCI were higher than the CPI. Although growth rates were fairly similar up to the June quarter 2019, from this point the growth rates diverge. This is likely due to the effect of mortgage interest charges.

Using the CPI, both the decile (3.5 per cent) and quintile (3 per cent) measures of low-paid employee households resulted in higher real wage growth than using the published CPI (2.7 per cent) over the period.

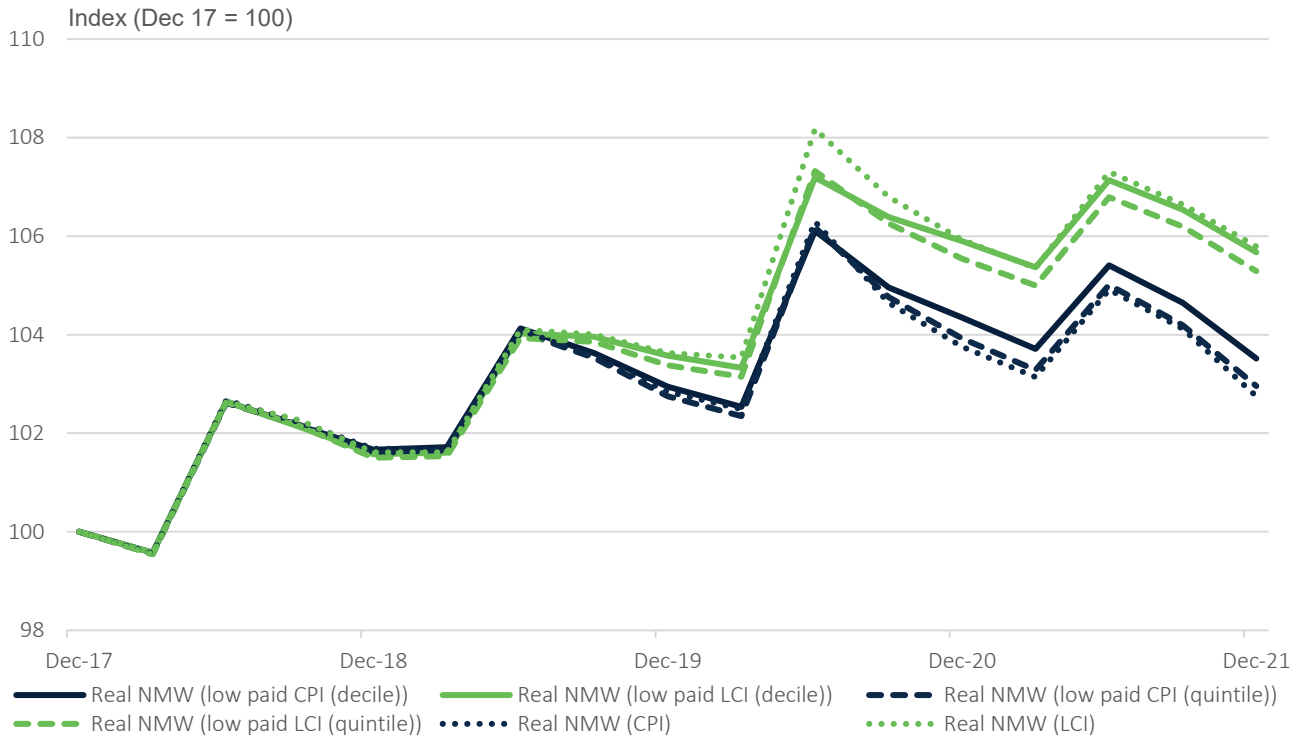
Using the LCI the outcomes were reversed, with both the quintile (5.3 per cent) and decile (5.7 per cent) measures having lower growth over the period than the published LCI (5.8 per cent).



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**Chart 7.6: Growth in the real minimum wages using low-paid CPI and LCI as deflators, cumulative growth rates, December quarter 2017 to December quarter 2021**



Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



## 8. Conclusion

This report developed alternative measures for inflation and the cost of living specific to the expenditure patterns of low-paid employee households using a similar approach to previous studies in Australia. Compared with previous research, this paper focused on a more recent period of analysis impacted by the COVID-19 pandemic.

Expenditure patterns are derived using the HES. The differences in expenditure between low-paid employee households and all households showed that low-paid employee households spend a higher proportion on Food and non-alcoholic beverages, Housing, Health, Communication and Education and a lower proportion on Recreation and culture, Alcohol and tobacco, and Furnishings, household equipment and services. This suggests that low-paid employee households spend more money on non-discretionary items relative to other households.

Although the measures of the CPI and LCI for low-paid employee households did not vary significantly from the published CPI and LCI, the research has shown that these measures can vary due to different expenditure patterns and changes in relative prices. In comparing the growth rates with the published data, the results show that the minor differences in inflation or cost of living outcomes are due to the different proportions of expenditure being spent on certain items, such as tobacco and mortgage interest charges. More recently, differences between outcomes were due to free child care offered in 2020 due to the COVID-19 pandemic. These measures can therefore provide some analysis of differences in outcomes between low-paid and other households.

Inflation outcomes and increases in the cost of living during the period of analysis were relatively low compared with earlier periods (such as the 2000s and early 2010s) and may have contributed to the small differences reported in these measures between low-paid and all households. Such findings may not be the case during periods of higher inflation. While previous studies have found little difference in outcomes over the long term, continuing to derive these measures may identify periods where differences in expenditure patterns for low-paid employee households and other households may have a greater effect on inflation and the cost of living outcomes. For example, if rents or mortgage interest charges were to increase significantly, then the analysis may show very different inflation and/or cost of living outcomes for low-paid employee households compared with other households.



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# Appendix A: Expenditure weights

Table A1: CPI expenditure weights for all households and low-paid employee households, September 2017

	Weights				Difference relative to the CPI		
	Low paid CPI (quintile)	Low paid CPI (decile)	All households	Published CPI	Low paid CPI (quintile)	Low paid CPI (decile)	All households
	(%)	(%)	(%)	(%)	(ppt)	(ppt)	(ppt)
<b>Food and non-alcoholic beverages</b>	<b>17.4</b>	<b>17.9</b>	<b>16.0</b>	<b>16.1</b>	<b>1.4</b>	<b>1.8</b>	<b>-0.1</b>
Bread	0.6	0.7	0.5	0.5	0.1	0.1	0.0
Cakes and biscuits	0.8	0.8	0.6	0.7	0.1	0.1	0.0
Breakfast cereals	0.2	0.2	0.1	0.1	0.0	0.0	0.0
Other cereal products	0.2	0.3	0.2	0.2	0.1	0.1	0.0
Beef and veal	0.5	0.5	0.5	0.5	0.1	0.1	0.0
Pork	0.4	0.4	0.3	0.3	0.0	0.1	0.0
Lamb and goat	0.3	0.3	0.2	0.2	0.0	0.0	0.0
Poultry	0.5	0.5	0.4	0.4	0.1	0.1	0.0
Other meats	0.4	0.5	0.4	0.4	0.1	0.1	0.0
Fish and other seafood	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Milk	0.5	0.5	0.4	0.4	0.1	0.1	0.0
Cheese	0.3	0.3	0.3	0.3	0.0	0.0	0.0
Ice cream and other dairy products	0.4	0.4	0.3	0.3	0.1	0.1	0.0
Fruit	1.2	1.3	1.1	1.1	0.2	0.2	0.0
Vegetables	1.5	1.6	1.3	1.3	0.3	0.4	0.0
Eggs	0.2	0.2	0.1	0.1	0.0	0.0	0.0
Jams, honey and spreads	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Food additives and condiments	0.3	0.3	0.3	0.3	0.0	0.1	0.0
Oils and fats	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Snacks and confectionery	1.2	1.1	0.9	0.9	0.2	0.2	0.0
Other food products n.e.c.	0.6	0.6	0.5	0.6	0.1	0.1	0.0
Coffee, tea and cocoa	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Waters, soft drinks and juices	0.9	0.9	0.7	0.8	0.2	0.2	0.0
Restaurant meals	2.6	2.7	3.4	3.3	-0.7	-0.6	0.0
Take away and fast foods	2.8	2.9	2.5	2.6	0.3	0.3	0.0
<b>Alcohol and tobacco</b>	<b>6.4</b>	<b>5.2</b>	<b>7.0</b>	<b>7.1</b>	<b>-0.7</b>	<b>-1.9</b>	<b>-0.1</b>
Spirits	0.7	0.7	0.8	0.8	-0.1	-0.2	0.0
Wine	1.1	0.9	1.8	1.8	-0.7	-0.8	0.0
Beer	1.6	1.3	1.8	1.9	-0.3	-0.5	0.0
Tobacco	3.0	2.3	2.6	2.6	0.4	-0.3	0.0
<b>Clothing and footwear</b>	<b>3.3</b>	<b>3.8</b>	<b>3.5</b>	<b>3.6</b>	<b>-0.2</b>	<b>0.2</b>	<b>-0.1</b>
Garments for men	0.5	0.6	0.5	0.6	-0.1	0.0	-0.1
Garments for women	1.1	1.1	1.2	1.3	-0.1	-0.1	0.0
Garments for infants and children	0.5	0.6	0.3	0.3	0.2	0.3	0.0





	Weights				Difference relative to the CPI		
	Low paid CPI (quintile)	Low paid CPI (decile)	All households	Published CPI	Low paid CPI (quintile)	Low paid CPI (decile)	All households
	(%)	(%)	(%)	(%)	(ppt)	(ppt)	(ppt)
Footwear for men	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Footwear for women	0.3	0.4	0.3	0.3	0.0	0.1	0.0
Footwear for infants and children	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Accessories	0.5	0.7	0.7	0.7	-0.1	0.1	0.0
Cleaning, repair and hire of clothing and footwear	0.1	0.1	0.1	0.1	0.0	0.0	0.0
<b>Housing</b>	<b>24.1</b>	<b>23.2</b>	<b>22.7</b>	<b>22.7</b>	<b>1.4</b>	<b>0.5</b>	<b>0.0</b>
Rents	10.9	11.9	7.2	7.2	3.7	4.7	0.0
New dwelling purchase by owner-occupiers	5.8	3.9	7.7	7.8	-2.0	-3.9	-0.1
Maintenance and repair of the dwelling	1.4	1.3	2.4	2.1	-0.8	-0.8	0.2
Property rates and charges	1.4	1.3	1.4	1.5	-0.1	-0.1	0.0
Water and sewerage	1.1	1.0	1.0	1.0	0.1	0.0	0.0
Electricity	2.6	2.6	2.1	2.2	0.4	0.5	0.0
Gas and other household fuels	1.0	1.0	0.9	0.9	0.2	0.1	0.0
<b>Furnishings, household equipment and services</b>	<b>8.6</b>	<b>9.1</b>	<b>9.6</b>	<b>9.4</b>	<b>-0.7</b>	<b>-0.3</b>	<b>0.2</b>
Furniture	1.4	1.9	1.2	1.4	0.0	0.5	-0.1
Carpets and other floor coverings	0.4	0.2	0.3	0.3	0.1	-0.1	0.0
Household textiles	0.3	0.3	0.5	0.5	-0.2	-0.2	0.0
Major household appliances	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Small electric household appliances	0.4	0.2	0.3	0.3	0.0	-0.1	0.0
Glassware, tableware and household utensils	0.4	0.5	0.4	0.4	-0.1	0.0	0.0
Tools and equipment for house and garden	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Cleaning and maintenance products	0.3	0.3	0.3	0.3	0.0	0.0	0.0
Personal care products	1.3	1.5	1.1	1.1	0.2	0.4	0.0
Other non-durable household products	1.2	1.2	1.4	1.3	-0.1	-0.1	0.1
Child care	1.0	0.6	1.3	1.3	-0.4	-0.7	0.0
Hairdressing and personal grooming services	0.7	0.7	0.9	0.9	-0.2	-0.2	0.0
Other household services	0.7	0.9	1.1	0.7	-0.1	0.2	0.4
<b>Health</b>	<b>5.5</b>	<b>6.5</b>	<b>5.5</b>	<b>5.4</b>	<b>0.1</b>	<b>1.0</b>	<b>0.0</b>
Pharmaceutical products	0.9	1.0	1.0	1.0	-0.1	-0.1	0.0
Therapeutic appliances and equipment	0.1	0.1	0.2	0.1	0.0	0.0	0.0
Medical and hospital services	3.9	4.9	3.8	3.7	0.2	1.1	0.1
Dental services	0.6	0.5	0.5	0.5	0.1	0.0	0.0
<b>Transport</b>	<b>10.1</b>	<b>9.1</b>	<b>10.4</b>	<b>10.3</b>	<b>-0.2</b>	<b>-1.2</b>	<b>0.1</b>
Motor vehicles	1.8	1.1	2.7	2.8	-0.9	-1.7	0.0
Spare parts and accessories for motor vehicles	0.9	0.9	1.0	0.7	0.2	0.2	0.2
Automotive fuel	3.6	3.6	2.7	2.8	0.9	0.9	0.0
Maintenance and repair of motor vehicles	1.4	1.0	1.2	1.9	-0.6	-0.9	-0.7
Other services in respect of motor vehicles	1.6	1.7	2.0	1.4	0.2	0.3	0.6
Urban transport fares	0.8	0.8	0.7	0.7	0.0	0.0	0.0
<b>Communication</b>	<b>3.1</b>	<b>3.2</b>	<b>2.8</b>	<b>2.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.1</b>



	Weights				Difference relative to the CPI		
	Low paid CPI (quintile)	Low paid CPI (decile)	All households	Published CPI	Low paid CPI (quintile)	Low paid CPI (decile)	All households
	(%)	(%)	(%)	(%)	(ppt)	(ppt)	(ppt)
Postal services	0.1	0.0	0.1	0.1	0.0	-0.1	0.0
Telecommunication equipment and services	3.1	3.2	2.7	2.6	0.5	0.6	0.1
<b>Recreation and culture</b>	<b>11.0</b>	<b>10.6</b>	<b>13.2</b>	<b>12.7</b>	<b>-1.7</b>	<b>-2.1</b>	<b>0.5</b>
Audio, visual and computing equipment	0.8	0.8	1.0	1.2	-0.4	-0.4	-0.3
Audio, visual and computing media and services	0.6	0.6	0.7	0.7	-0.1	-0.1	0.0
Books	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Newspapers, magazines and stationery	0.5	0.5	0.5	0.5	0.0	0.0	0.0
Domestic holiday travel and accommodation	2.2	2.1	2.7	2.7	-0.5	-0.6	0.0
International holiday travel and accommodation	2.5	2.6	3.3	3.2	-0.7	-0.5	0.1
Equipment for sports, camping and open-air recreation	0.3	0.4	0.7	0.6	-0.3	-0.2	0.2
Games, toys and hobbies	0.8	0.8	0.9	0.8	0.0	0.0	0.1
Pets and related products	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Veterinary and other services for pets	0.3	0.3	0.4	0.4	-0.1	-0.1	0.0
Sports participation	1.1	1.0	1.3	1.0	0.1	0.1	0.4
Other recreational, sporting and cultural services	1.3	0.8	1.0	1.0	0.2	-0.2	0.0
<b>Education</b>	<b>4.6</b>	<b>5.7</b>	<b>3.7</b>	<b>4.3</b>	<b>0.3</b>	<b>1.4</b>	<b>-0.6</b>
Preschool and primary education	1.1	1.3	0.9	0.9	0.2	0.3	0.0
Secondary education	1.9	2.0	1.7	1.7	0.2	0.4	0.0
Tertiary education	1.6	2.4	1.2	1.6	0.0	0.7	-0.5
<b>Insurance and financial services</b>	<b>5.7</b>	<b>5.8</b>	<b>5.8</b>	<b>5.8</b>	<b>-0.1</b>	<b>0.0</b>	<b>0.0</b>
Insurance	1.1	1.2	1.2	1.2	-0.1	0.0	0.0
Deposit and loan facilities (direct charges)	0.6	0.6	0.6	0.6	0.0	0.0	0.0
Other financial services	4.0	4.0	4.0	4.0	0.0	0.0	0.0

Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015-16*; ABS (2017b).



**Table A2: LCI expenditure weights for all households and low-paid employee households, September 2017**

	Weights				Difference relative to all employee households		
	Low paid LCI (quintile) (%)	Low paid LCI (decile) (%)	All employee households (%)	Published LCI (%)	Low paid LCI (quintile) (ppt)	Low paid LCI (decile) (ppt)	All employee households
<b>Food and non-alcoholic beverages</b>	<b>17.8</b>	<b>17.9</b>	<b>16.4</b>	<b>16.9</b>	<b>0.9</b>	<b>1.0</b>	<b>-0.5</b>
Bread	0.7	0.7	0.5	0.6	0.1	0.1	0.0
Cakes and biscuits	0.8	0.8	0.6	0.7	0.1	0.1	0.0
Breakfast cereals	0.2	0.2	0.1	0.1	0.0	0.0	0.0
Other cereal products	0.2	0.3	0.2	0.2	0.1	0.1	0.0
Beef and veal	0.5	0.5	0.4	0.5	0.1	0.1	0.0
Pork	0.4	0.4	0.3	0.3	0.1	0.1	0.0
Lamb and goat	0.3	0.3	0.2	0.2	0.0	0.1	0.0
Poultry	0.5	0.5	0.4	0.5	0.1	0.1	0.0
Other meats	0.4	0.5	0.4	0.4	0.1	0.1	0.0
Fish and other seafood	0.4	0.4	0.4	0.4	0.0	0.1	0.0
Milk	0.5	0.5	0.3	0.4	0.2	0.1	0.0
Cheese	0.3	0.3	0.3	0.3	0.0	0.0	0.0
Ice cream and other dairy products	0.4	0.4	0.3	0.3	0.1	0.1	0.0
Fruit	1.2	1.3	1.0	1.1	0.2	0.2	0.0
Vegetables	1.6	1.6	1.3	1.3	0.3	0.3	-0.1
Eggs	0.2	0.2	0.1	0.1	0.0	0.0	0.0
Jams, honey and spreads	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Food additives and condiments	0.3	0.3	0.3	0.3	0.0	0.0	0.0
Oils and fats	0.2	0.2	0.1	0.2	0.0	0.0	0.0
Snacks and confectionery	1.2	1.1	0.9	1.0	0.2	0.2	0.0
Other food products n.e.c.	0.7	0.7	0.6	0.6	0.1	0.1	0.0
Coffee, tea and cocoa	0.2	0.2	0.2	0.2	0.0	0.0	0.0
Waters, soft drinks and juices	0.9	0.9	0.8	0.8	0.1	0.1	0.0
Restaurant meals	2.6	2.7	3.6	3.6	-1.0	-1.0	0.0
Take away and fast foods	2.9	2.9	2.8	2.9	0.0	-0.1	-0.1
<b>Alcohol and tobacco</b>	<b>6.6</b>	<b>5.2</b>	<b>7.2</b>	<b>7.5</b>	<b>-1.0</b>	<b>-2.4</b>	<b>-0.3</b>
Spirits	0.7	0.7	0.9	1.0	-0.2	-0.3	-0.1
Wine	1.1	0.9	1.8	1.9	-0.8	-0.9	0.0
Beer	1.6	1.3	2.0	2.1	-0.5	-0.8	-0.1
Tobacco	3.1	2.3	2.5	2.6	0.5	-0.4	-0.2
<b>Clothing and footwear</b>	<b>3.4</b>	<b>3.8</b>	<b>3.7</b>	<b>3.8</b>	<b>-0.4</b>	<b>0.0</b>	<b>0.0</b>
Garments for men	0.5	0.6	0.6	0.6	-0.1	0.0	0.0
Garments for women	1.2	1.1	1.3	1.4	-0.2	-0.2	0.0
Garments for infants and children	0.5	0.6	0.4	0.4	0.1	0.2	0.0
Footwear for men	0.1	0.1	0.2	0.2	0.0	0.0	0.0
Footwear for women	0.3	0.4	0.3	0.4	0.0	0.1	0.0
Footwear for infants and children	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Accessories	0.5	0.7	0.8	0.7	-0.2	0.0	0.1
Cleaning, repair and hire of clothing and footwear	0.1	0.1	0.1	0.1	0.0	0.0	0.0



	Weights				Difference relative to all employee households		
	Low paid LCI (quintile) (%)	Low paid LCI (decile) (%)	All employee households (%)	Published LCI (%)	Low paid LCI (quintile) (ppt)	Low paid LCI (decile) (ppt)	All employee households
<b>Housing</b>	<b>18.7</b>	<b>19.3</b>	<b>15.0</b>	<b>14.8</b>	<b>3.9</b>	<b>4.5</b>	<b>0.2</b>
Rents	11.1	12.0	7.5	7.6	3.5	4.3	-0.1
Maintenance and repair of the dwelling	1.4	1.3	2.4	1.9	-0.5	-0.6	0.5
Property rates and charges	1.4	1.3	1.3	1.4	0.0	0.0	-0.1
Water and sewerage	1.1	1.0	0.9	1.0	0.1	0.1	0.0
Electricity	2.6	2.6	2.1	2.1	0.5	0.5	-0.1
Gas and other household fuels	1.0	1.0	0.8	0.8	0.2	0.2	0.0
<b>Furnishings, household equipment and services</b>	<b>8.8</b>	<b>9.1</b>	<b>10.1</b>	<b>9.9</b>	<b>-1.1</b>	<b>-0.8</b>	<b>0.2</b>
Furniture	1.4	1.9	1.3	1.4	0.1	0.5	-0.1
Carpets and other floor coverings	0.4	0.2	0.3	0.3	0.1	0.0	0.0
Household textiles	0.3	0.3	0.4	0.5	-0.2	-0.1	0.0
Major household appliances	0.4	0.4	0.4	0.4	0.0	0.0	0.0
Small electric household appliances	0.4	0.2	0.3	0.3	0.1	-0.1	0.0
Glassware, tableware and household utensils	0.4	0.5	0.4	0.5	-0.1	0.0	0.0
Tools and equipment for house and garden	0.4	0.4	0.4	0.4	-0.1	0.0	0.0
Cleaning and maintenance products	0.3	0.3	0.2	0.3	0.0	0.0	0.0
Personal care products	1.3	1.5	1.1	1.2	0.1	0.3	0.0
Other non-durable household products	1.2	1.2	1.4	1.4	-0.1	-0.2	0.0
Child care	1.0	0.6	1.7	1.7	-0.7	-1.1	-0.1
Hairdressing and personal grooming services	0.7	0.7	1.0	1.0	-0.3	-0.3	0.0
Other household services	0.7	0.9	1.1	0.7	0.0	0.2	0.4
<b>Health</b>	<b>5.6</b>	<b>6.5</b>	<b>5.2</b>	<b>5.4</b>	<b>0.2</b>	<b>1.1</b>	<b>-0.2</b>
Pharmaceutical products	0.9	1.0	0.9	1.0	0.0	0.0	0.0
Therapeutic appliances and equipment	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Medical and hospital services	4.0	4.9	3.7	3.9	0.1	1.0	-0.1
Dental services	0.6	0.5	0.5	0.5	0.1	0.0	0.0
<b>Transport</b>	<b>10.3</b>	<b>9.1</b>	<b>11.3</b>	<b>10.2</b>	<b>0.1</b>	<b>-1.1</b>	<b>1.1</b>
Motor vehicles	1.9	1.1	3.0	2.8	-1.0	-1.7	0.2
Spare parts and accessories for motor vehicles	0.9	0.9	1.1	0.8	0.2	0.1	0.3
Automotive fuel	3.7	3.6	2.8	2.9	0.8	0.7	-0.1
Maintenance and repair of motor vehicles	1.4	1.0	1.3	1.3	0.1	-0.3	-0.1
Other services in respect of motor vehicles	1.6	1.7	2.3	1.5	0.1	0.2	0.8
Urban transport fares	0.8	0.8	0.8	0.9	-0.1	-0.1	0.0
<b>Communication</b>	<b>3.2</b>	<b>3.2</b>	<b>2.8</b>	<b>2.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.1</b>
Postal services	0.1	0.0	0.1	0.1	0.0	0.0	0.0
Telecommunication equipment and services	3.2	3.2	2.7	2.7	0.5	0.5	0.1
<b>Recreation and culture</b>	<b>11.2</b>	<b>10.6</b>	<b>13.6</b>	<b>13.1</b>	<b>-1.9</b>	<b>-2.4</b>	<b>0.5</b>
Audio, visual and computing equipment	0.9	0.8	1.0	1.1	-0.3	-0.3	-0.1
Audio, visual and computing media and services	0.6	0.6	0.7	0.7	-0.1	-0.1	0.0
Books	0.2	0.2	0.2	0.3	0.0	0.0	0.0
Newspapers, magazines and stationery	0.5	0.5	0.4	0.4	0.0	0.1	0.0
Domestic holiday travel and accommodation	2.2	2.1	2.7	2.8	-0.5	-0.7	-0.1



	Weights				Difference relative to all employee households		
	Low paid LCI (quintile) (%)	Low paid LCI (decile) (%)	All employee households (%)	Published LCI (%)	Low paid LCI (quintile) (ppt)	Low paid LCI (decile) (ppt)	All employee households
International holiday travel and accommodation	2.5	2.6	3.2	3.2	-0.7	-0.6	0.0
Equipment for sports, camping and open-air recreation	0.3	0.4	0.8	0.6	-0.3	-0.2	0.2
Games, toys and hobbies	0.8	0.8	1.0	0.9	-0.1	-0.1	0.1
Pets and related products	0.4	0.4	0.4	0.5	0.0	0.0	0.0
Veterinary and other services for pets	0.3	0.3	0.3	0.4	-0.1	-0.1	0.0
Sports participation	1.1	1.0	1.5	1.1	0.0	-0.1	0.4
Other recreational, sporting and cultural services	1.3	0.8	1.1	1.2	0.2	-0.3	0.0
<b>Education</b>	<b>4.7</b>	<b>5.7</b>	<b>4.0</b>	<b>4.3</b>	<b>0.4</b>	<b>1.4</b>	<b>-0.2</b>
Preschool and primary education	1.1	1.3	1.0	1.1	0.0	0.2	-0.1
Secondary education	1.9	2.1	1.8	1.9	0.0	0.2	-0.1
Tertiary education	1.6	2.4	1.2	1.3	0.4	1.1	-0.1
<b>Insurance and financial services</b>	<b>9.8</b>	<b>9.6</b>	<b>10.7</b>	<b>11.4</b>	<b>-1.6</b>	<b>-1.8</b>	<b>-0.7</b>
Insurance	3.5	3.6	3.5	3.2	0.3	0.4	0.3
Mortgage interest	5.9	5.6	6.7	7.0	-1.1	-1.4	-0.2
Consumer credit	0.5	0.4	0.5	1.2	-0.8	-0.8	-0.7

Note: The published ABS data only contains the weights for aggregated interest charges category and not the detailed weights for mortgage interest and consumer credit. These data were provided by the ABS.

Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015-16*; ABS, *Selected Living Cost Indexes: 17<sup>th</sup> Series Weighting Pattern, Sep 2017*.



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**Table A3: CPI expenditure weights for all households and low-paid employee households, September quarter 2021**

	Low paid CPI (quintile)	Low paid CPI (decile)	All households published CPI
	(%)	(%)	(%)
Food and non-alcoholic beverages	18.1	18.7	16.8
Alcohol and tobacco	8.3	6.7	9.0
Clothing and footwear	3.1	3.6	3.3
Housing	23.9	22.7	23.2
Furnishings, household equipment and services	8.5	9.1	9.2
Health	6.6	7.8	6.5
Transport	10.4	9.5	10.6
Communication	2.8	2.9	2.4
Recreation and culture	7.5	7.2	8.6
Education	5.0	6.2	4.6
Insurance and financial services	5.7	5.8	5.8
	100.0	100.0	100.0

Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS (2021d).



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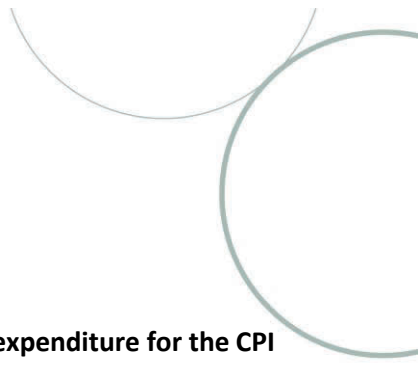
**Table A4: LCI expenditure weights for all employee households and low-paid employee households,  
September quarter 2021**

	Low paid LCI (quintile)	Low paid LCI (decile)	All employee households published LCI
	(%)	(%)	(%)
Food and non-alcoholic beverages	18.8	19.0	18.1
Alcohol and tobacco	8.6	6.8	9.9
Clothing and footwear	3.2	3.7	3.6
Housing	18.5	19.1	15.1
Furnishings, household equipment and services	8.8	9.2	9.8
Health	6.8	7.9	6.6
Transport	10.8	9.6	10.8
Communication	2.9	2.9	2.5
Recreation and culture	7.8	7.3	9.1
Education	5.2	6.3	4.8
Insurance and financial services	8.4	8.3	9.5
	100.0	100.0	100.0

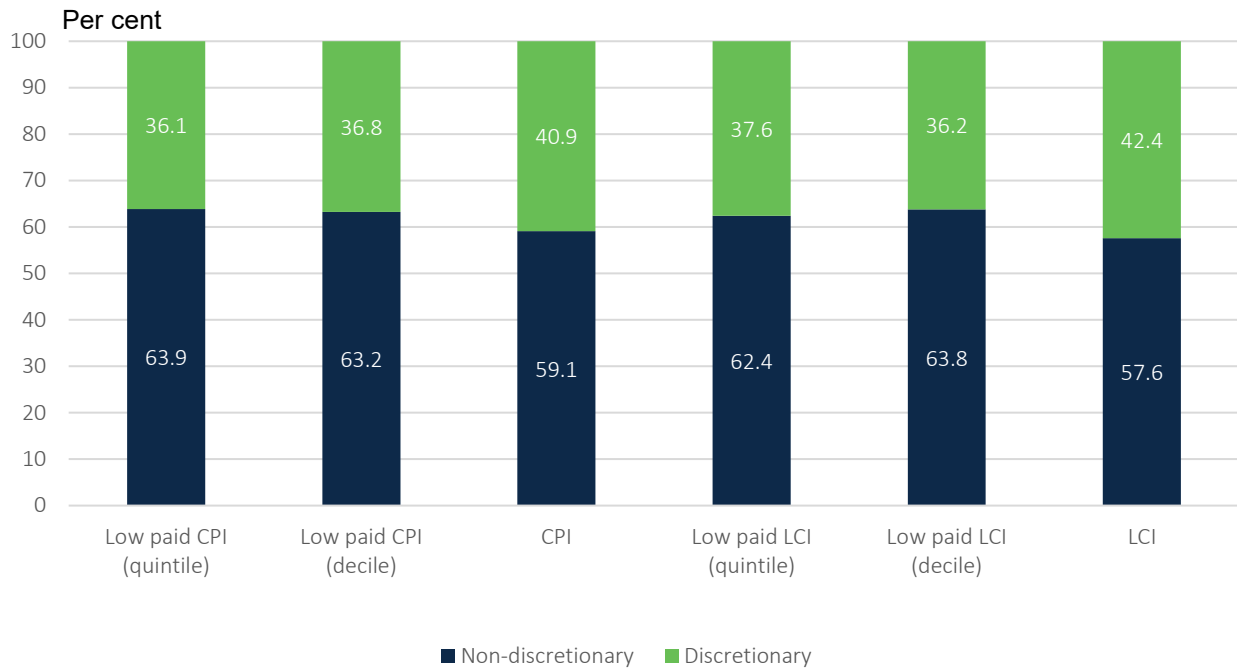
Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS (2021d).



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**Chart A1: Non-discretionary and discretionary expenditure as a proportion of total expenditure for the CPI and LCI, low-paid employee households, September quarter 2021**



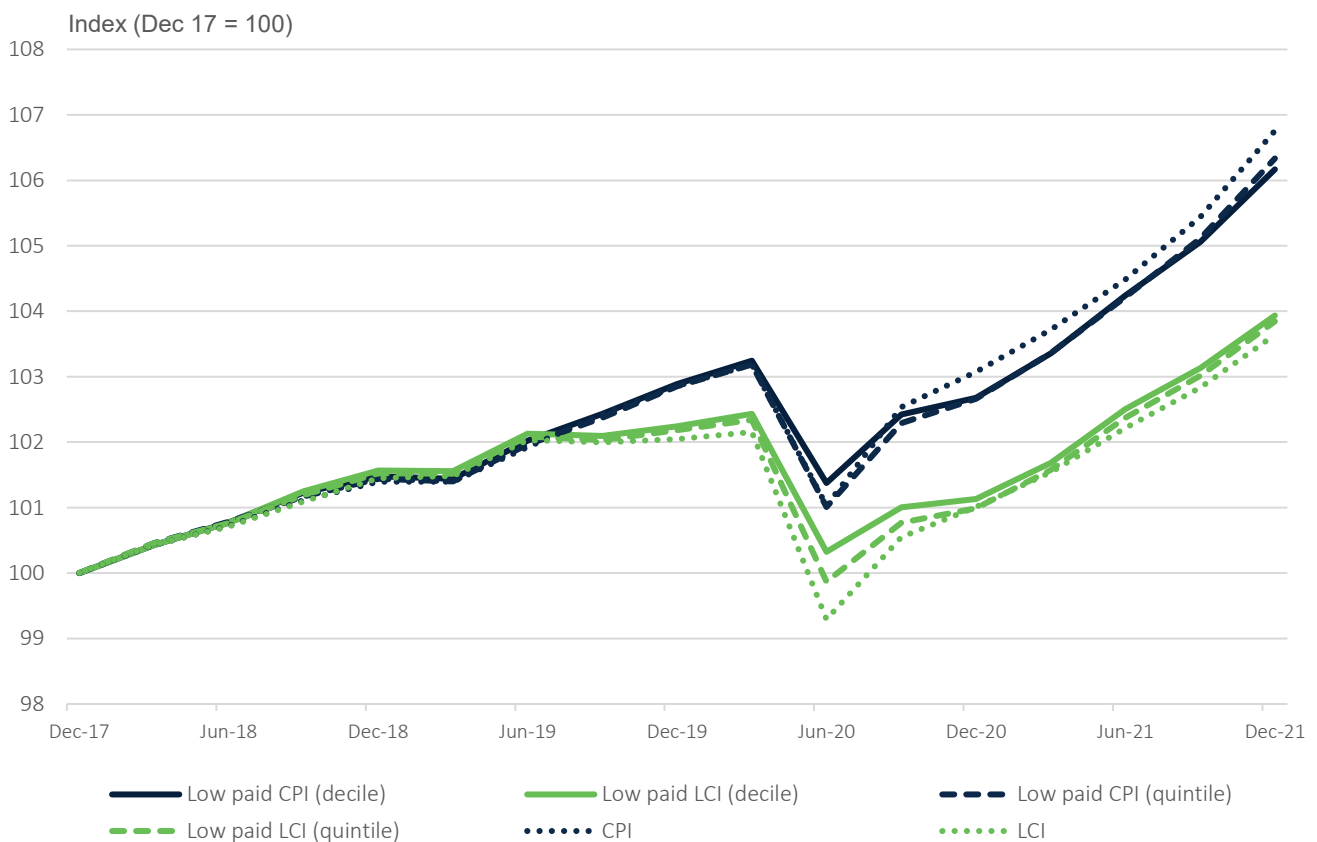
Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015-16*; ABS (2021d).



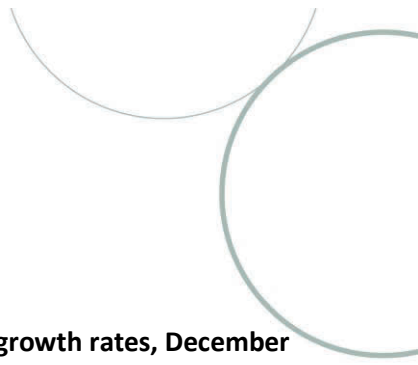


# Appendix B: Exclusion measures for the low-paid CPI and LCI

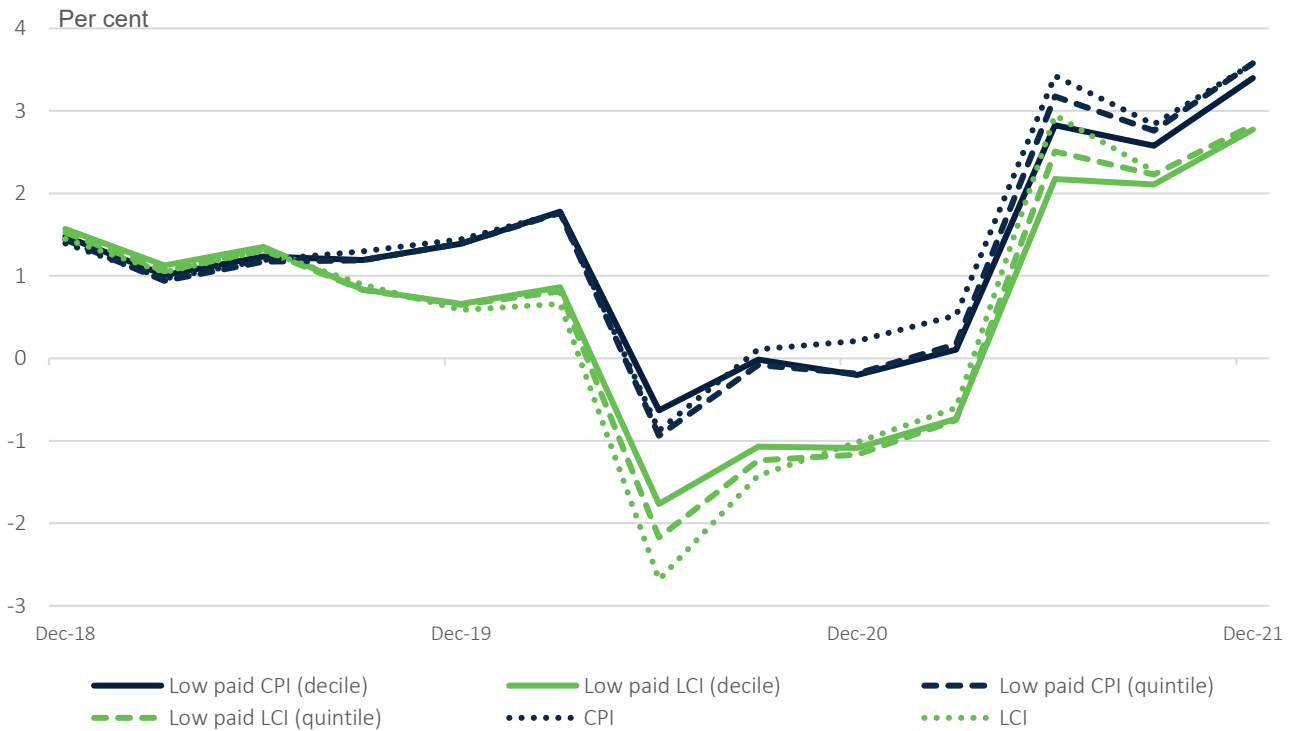
Chart B1: CPI and LCI for low-paid employee households excluding tobacco, cumulative growth rates, December quarter 2017 to December quarter 2021



Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



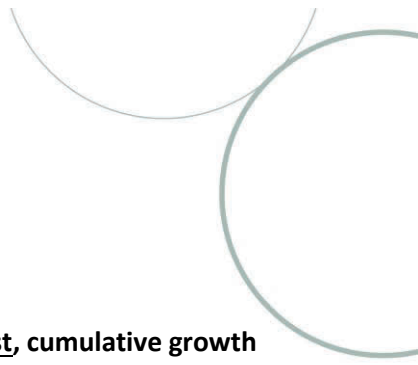
**Chart B2: CPI and LCI for low-paid employee households excluding tobacco, annual growth rates, December quarter 2018 to December quarter 2021**



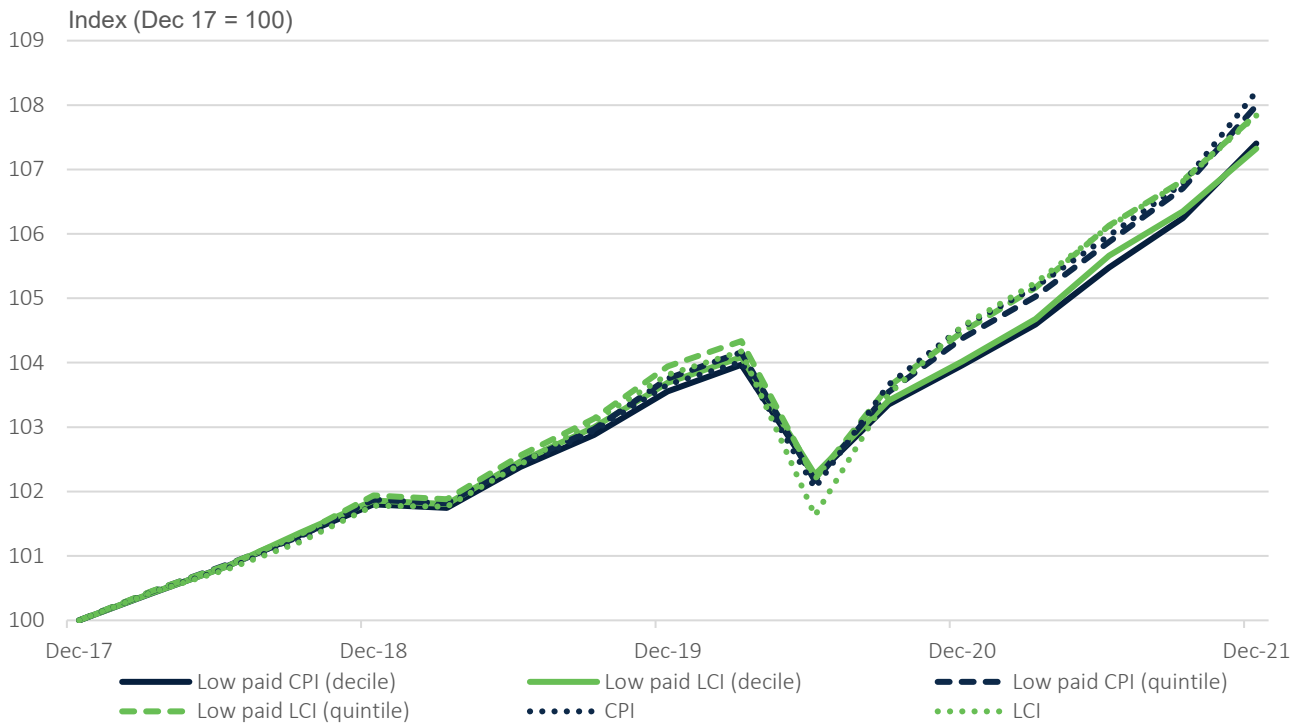
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



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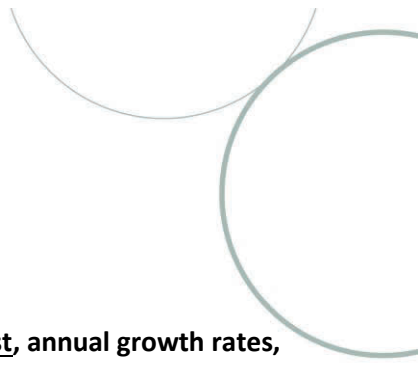
**Chart B3: CPI and LCI for low-paid employee households excluding mortgage interest, cumulative growth rates, December quarter 2017 to December quarter 2021**



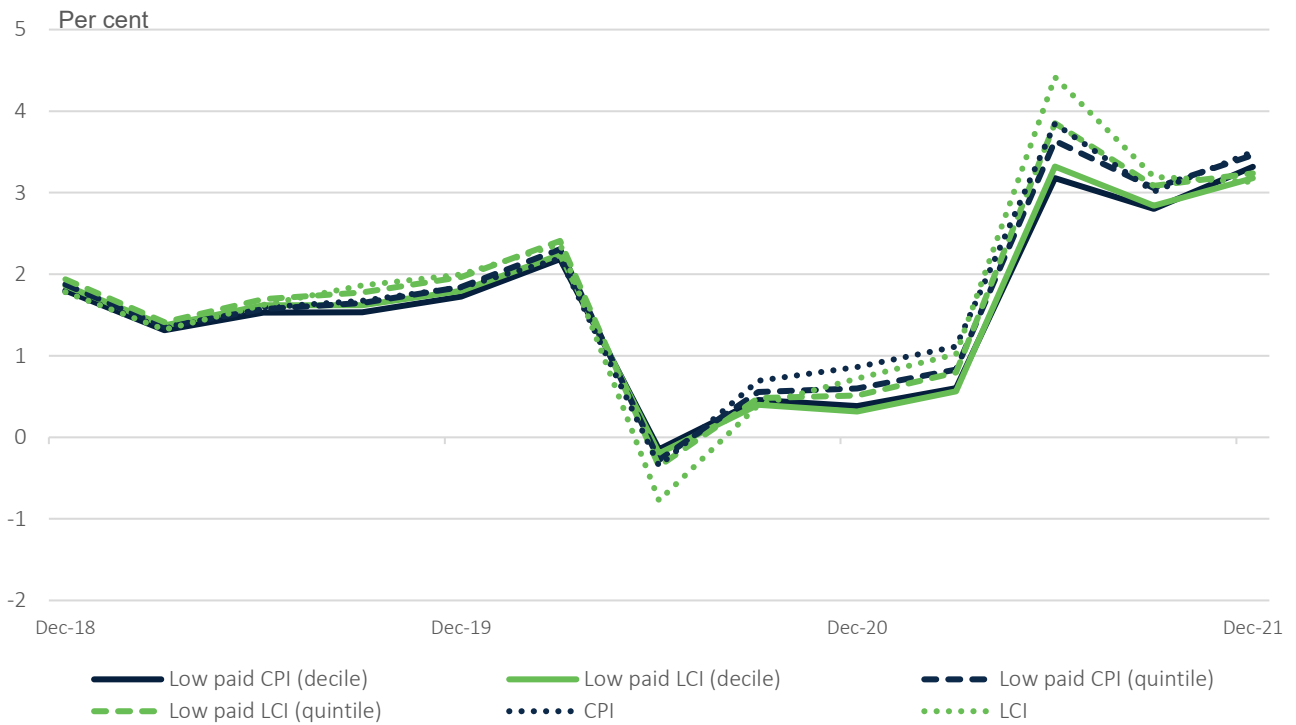
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



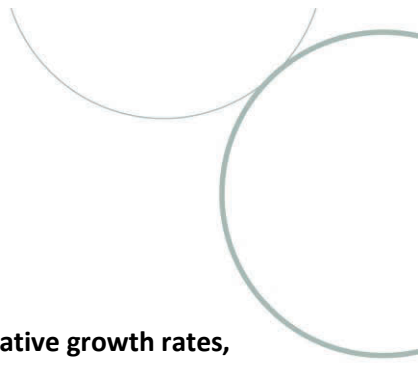
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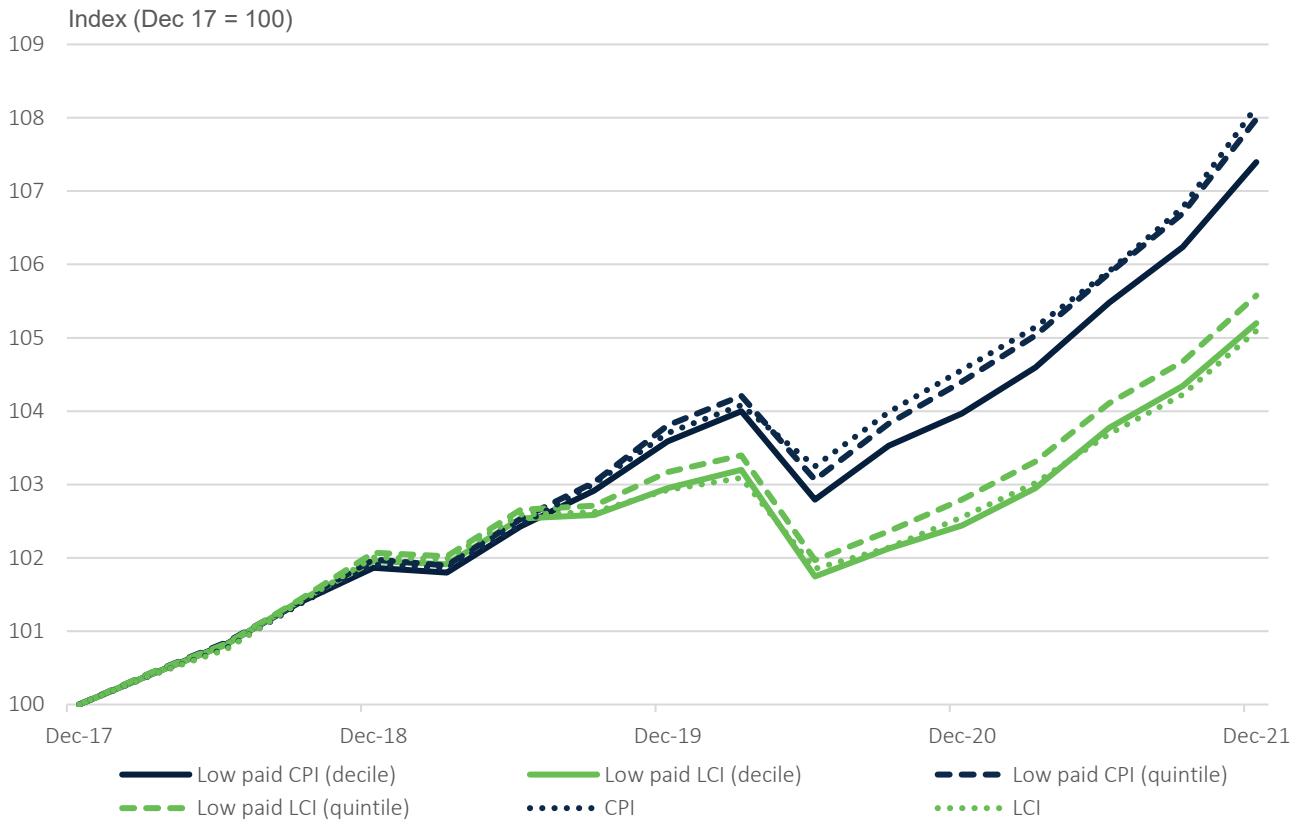
**Chart B4: CPI and LCI for low-paid employee households excluding mortgage interest, annual growth rates, December quarter 2018 to December quarter 2021**



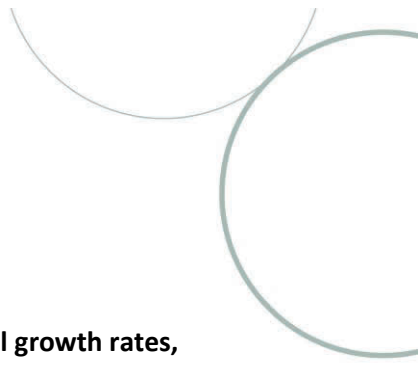
Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



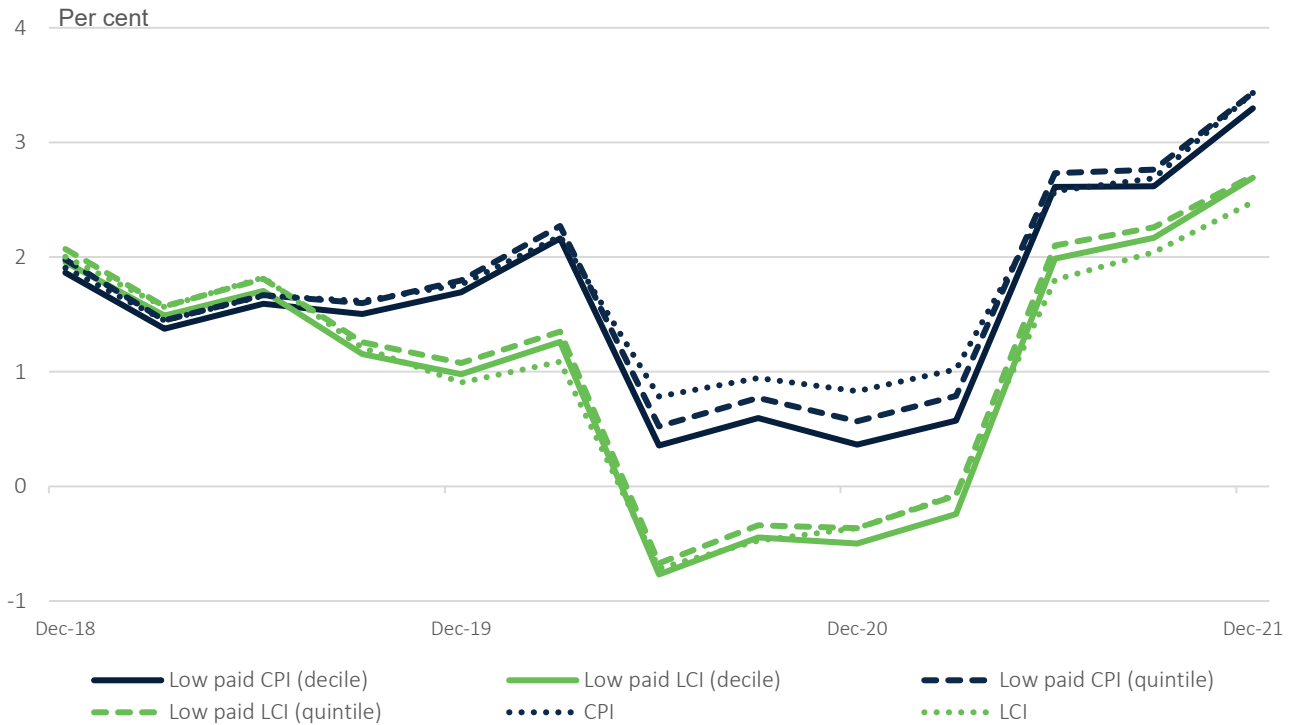
**Chart B5: CPI and LCI for low-paid employee households excluding child care, cumulative growth rates, December quarter 2017 to December quarter 2021**



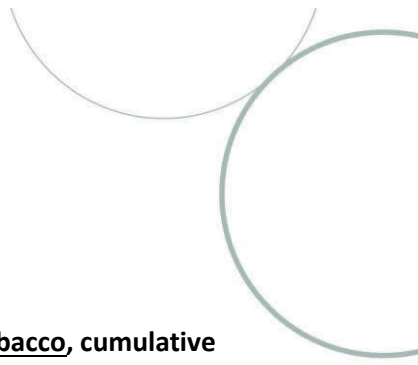
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



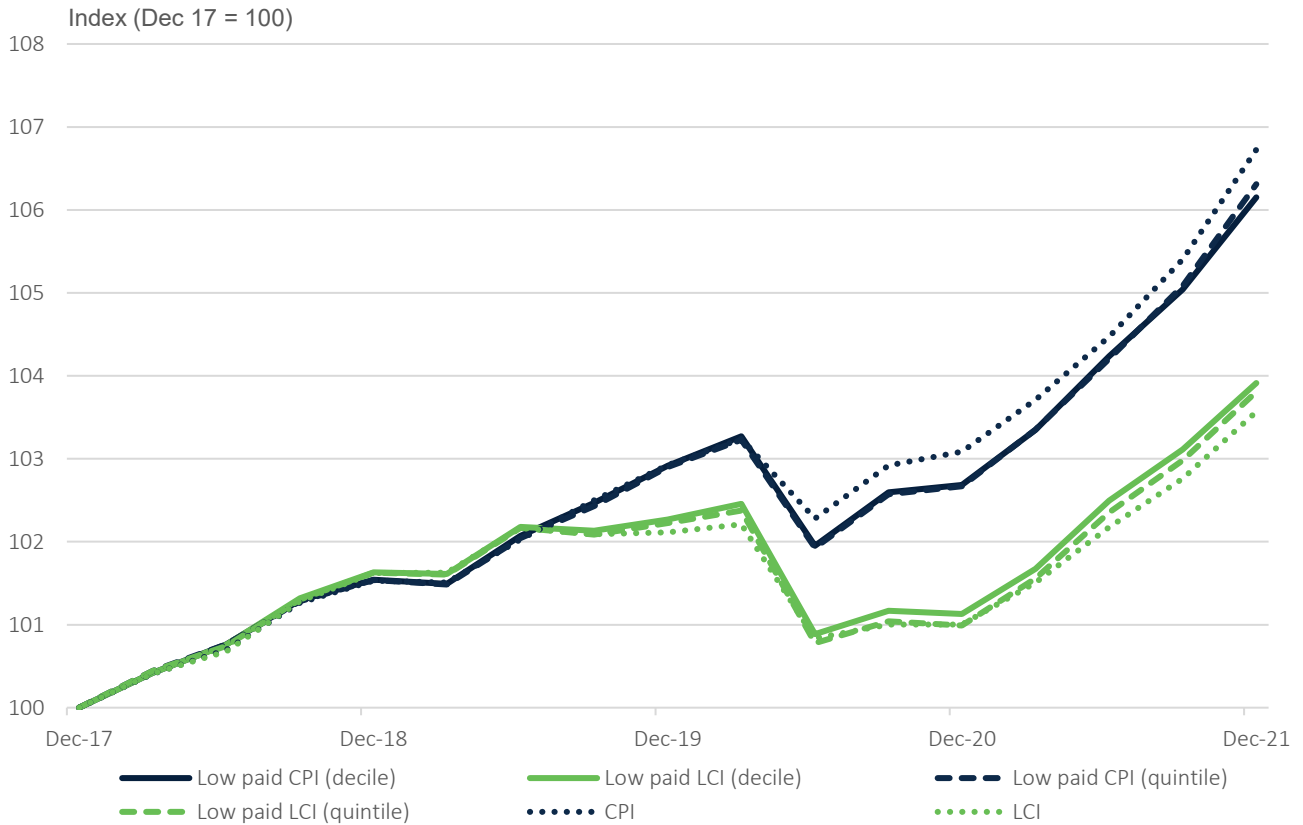
**Chart B6: CPI and LCI for low-paid employee households excluding child care, annual growth rates, December quarter 2018 to December quarter 2021**



Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



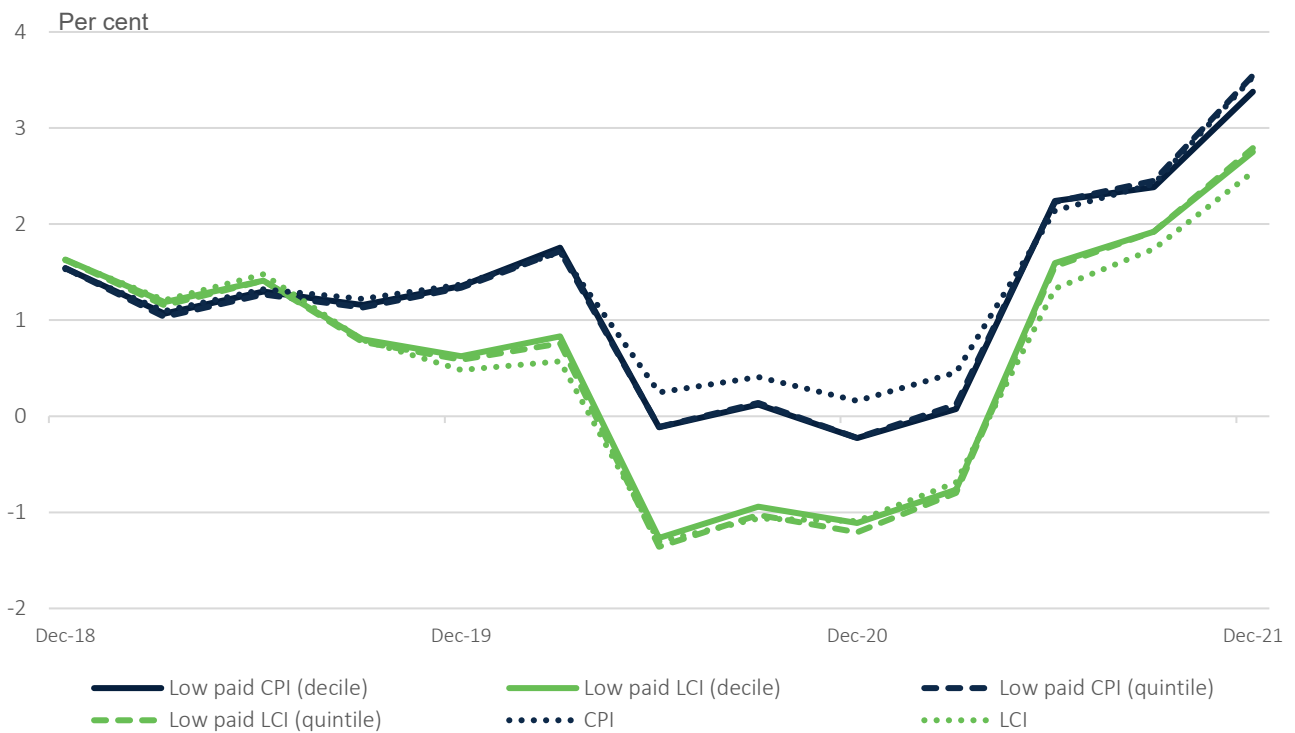
**Chart B7: CPI and LCI for low-paid employee households excluding child care and tobacco, cumulative growth rates, December quarter 2017 to December quarter 2021**



Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



**Chart B8: CPI and LCI for low-paid employee households excluding child care and tobacco, annual growth rates, December quarter 2018 to December quarter 2021**



Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.





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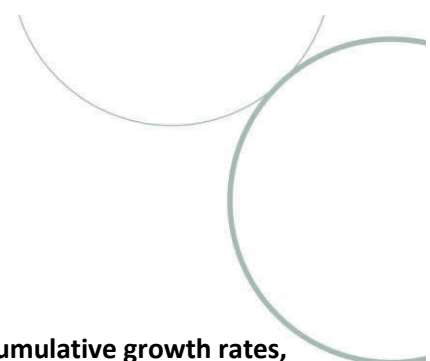
# Appendix C: Trends in inflation and cost of living by expenditure group

Analysis on the 11 expenditure groups is provided to further illustrate differences in inflation and the cost of living between low-paid employee households and the published series.

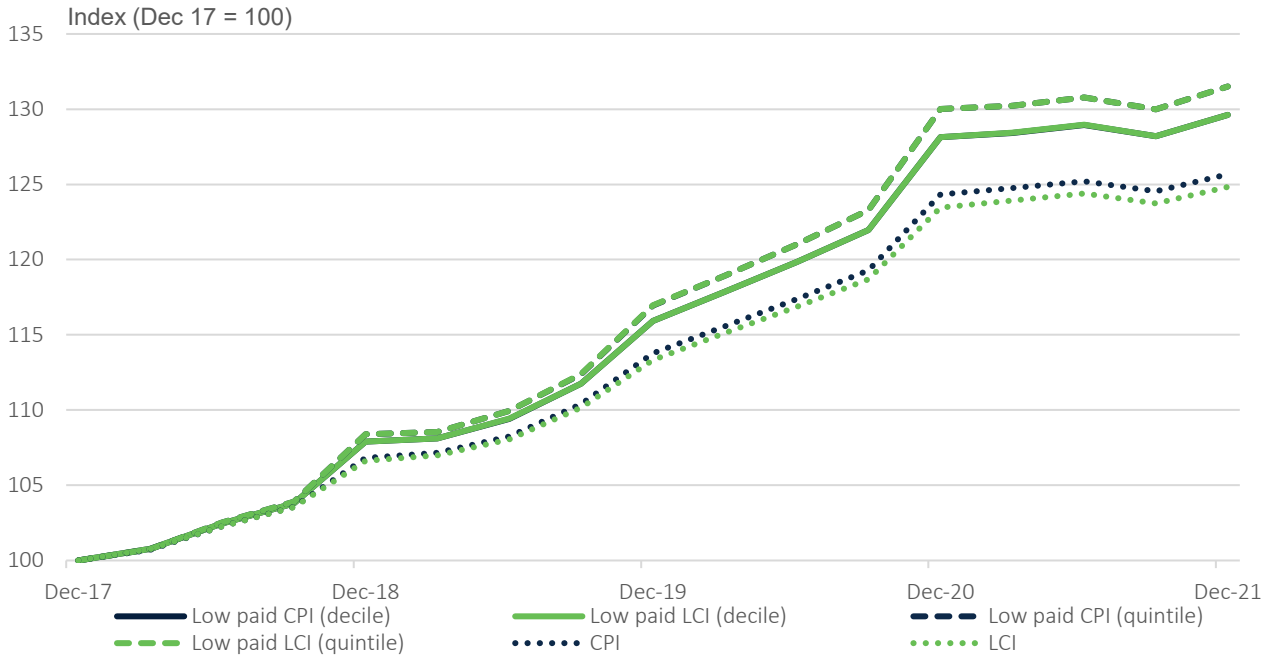
For Alcohol and tobacco, the low-paid LCI and CPI measures experienced higher growth over the period (around 30 per cent) relative to the published LCI and CPI (around 25 per cent). The deviation between the series began in the December quarter 2018 and the difference increased due to the increases in the federal excise tax on tobacco and indexation based on Average Weekly Ordinary Time Earnings that occurs in the December quarter.<sup>39</sup>

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<sup>39</sup> ABS, *Consumer Price Index, Australia*, December 2018; ABS, *Consumer Price Index, Australia*, December 2019; ABS, *Consumer Price Index, Australia*, December 2020.



**Chart C1: CPI and LCI for low-paid employee households for Alcohol and tobacco, cumulative growth rates, December quarter 2017 to December quarter 2021**

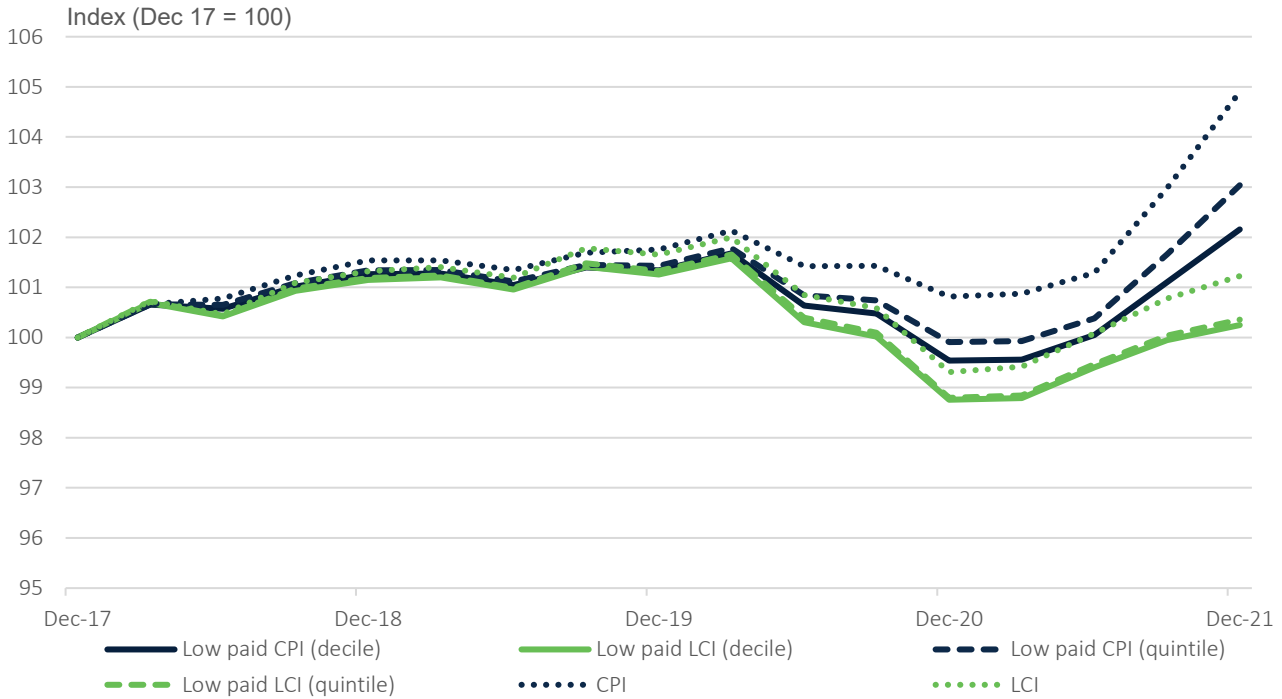


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

For Housing, growth was higher for all CPI measures over the period. The differences were mainly due the exclusion of New dwelling purchase by owner-occupiers in the LCI. In addition, the expenditure weight applied to rents is higher for the low-paid CPI and LCI measures, which particularly underperformed following the onset of the pandemic, and partly explains why the low-paid measures were below those of other households.

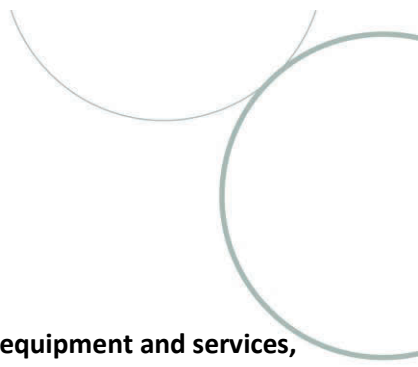


**Chart C2: CPI and LCI for low-paid employee households for Housing, cumulative growth rates, December quarter 2017 to December quarter 2021**

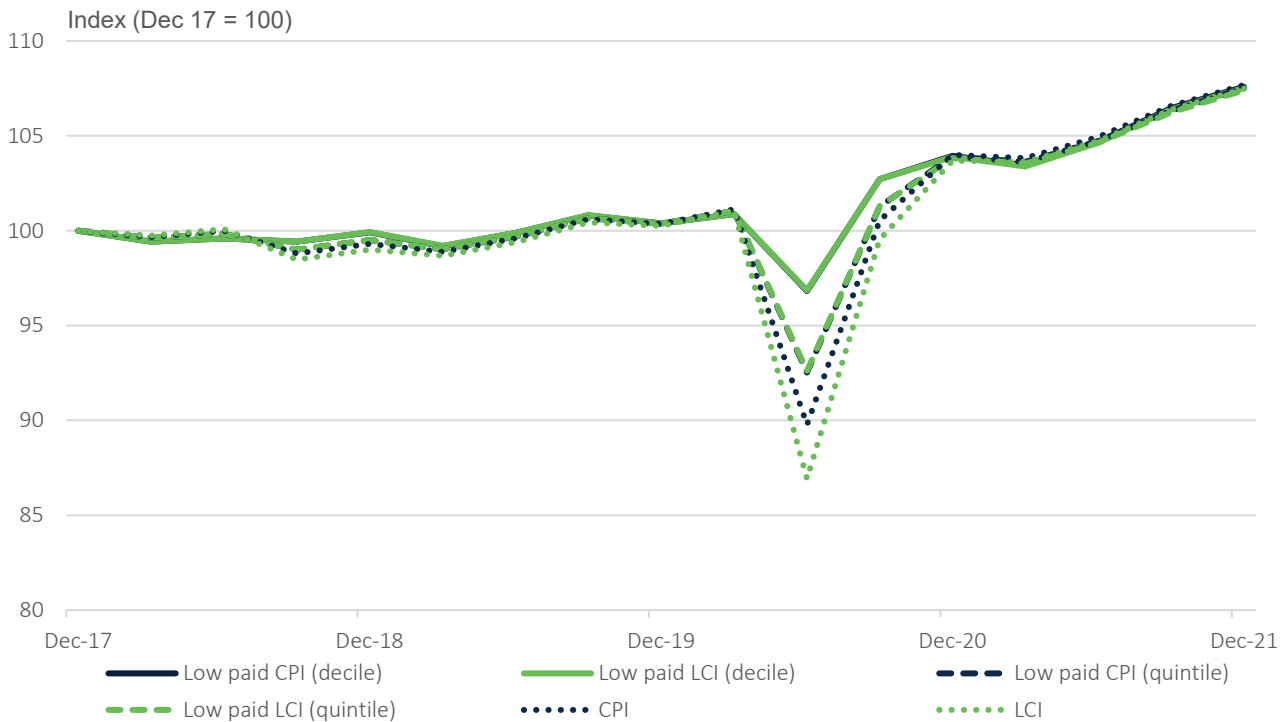


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

For Furnishings, household equipment and services, LCI and CPI measures for low-paid employee households and the published measures increased at a similar rate over the period (around 7.4 to 7.7 per cent). However, this varied significantly between the June quarter 2020 and September quarter 2020 due to the introduction of free child care, and its subsequent unwinding, with the low-paid decile and quintile measures of the CPI and LCI not experiencing as large of a decline due to the smaller expenditure weight applied to Child care.

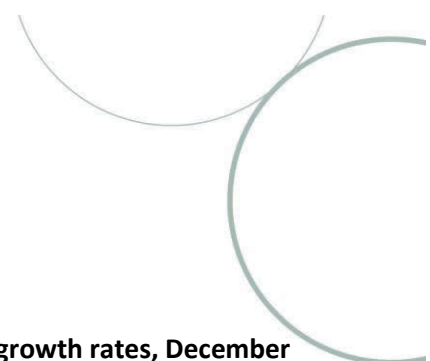


**Chart C3: CPI and LCI for low-paid employee households for Furnishings, household equipment and services, cumulative growth rates, December quarter 2017 to December quarter 2021**

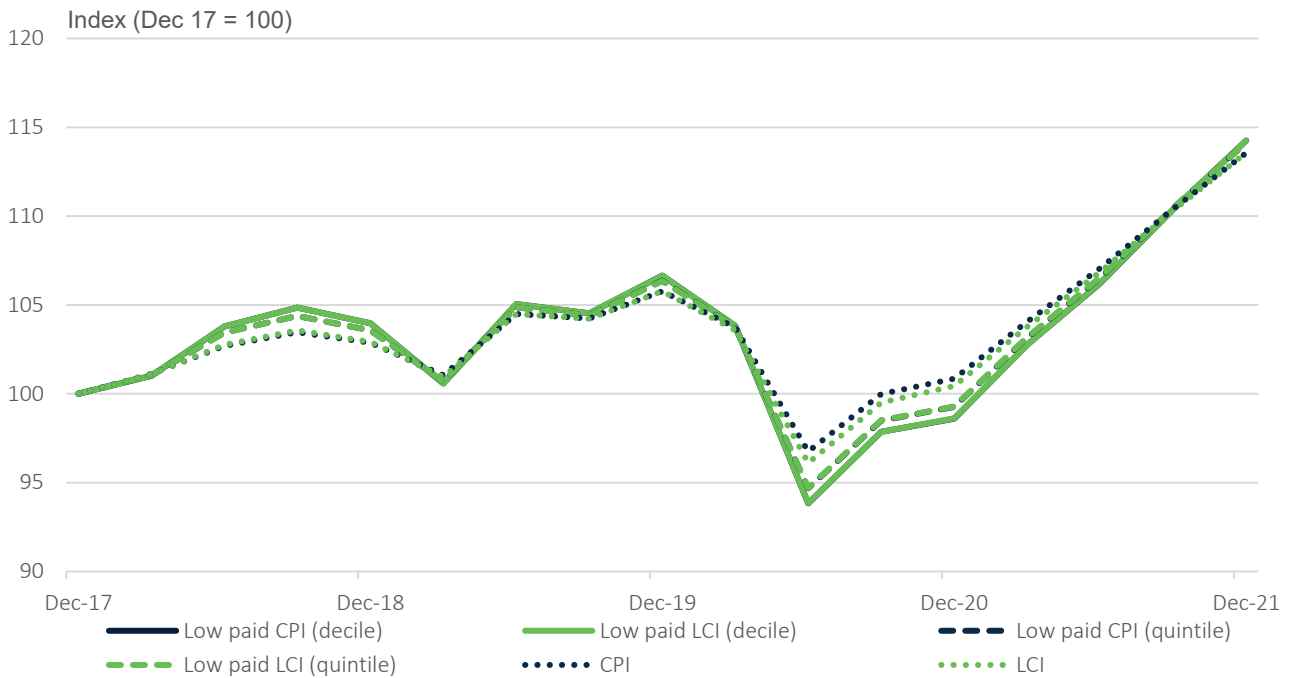


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

For Transport, trends over the period were similar for low-paid employee households and all households for both the CPI and LCI, increasing by around 14 per cent. However, both measures of the low-paid CPI and LCI experienced larger declines in the June quarter 2020. This is because low-paid employee households across both measures spend a higher proportion on automotive fuel, and therefore were more affected by the decline in automotive fuel prices (–19.3 per cent) in the June quarter 2020. However, these differences did not last, as automotive fuel prices recovered afterwards.

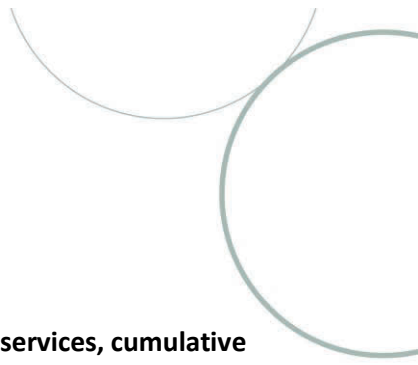


**Chart C4: CPI and LCI for low-paid employee households for Transport, cumulative growth rates, December quarter 2017 to December quarter 2021**

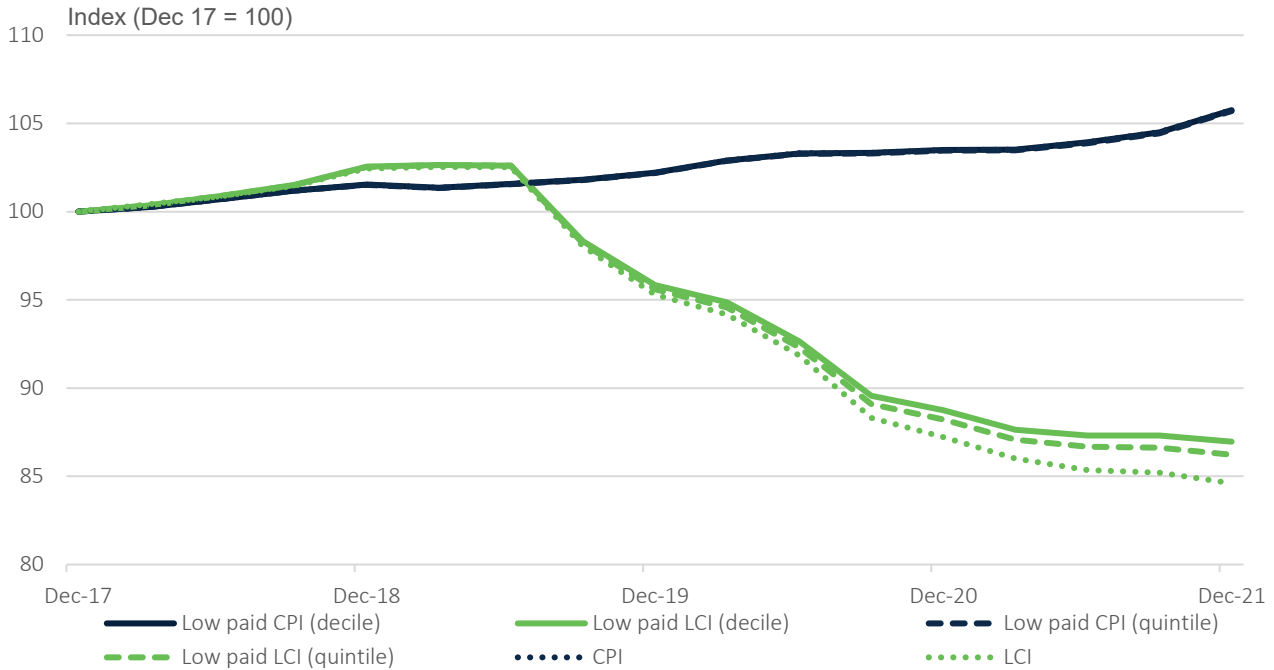


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

There were significant differences in the outcomes for Insurance and financial services between the CPI and LCI. These differences are mainly driven by changes in mortgage interest, which is included in the LCI but not in the CPI. Both measures of the low-paid LCI did not fall as much as the published LCI as a lower expenditure weight for mortgage interest is applied.

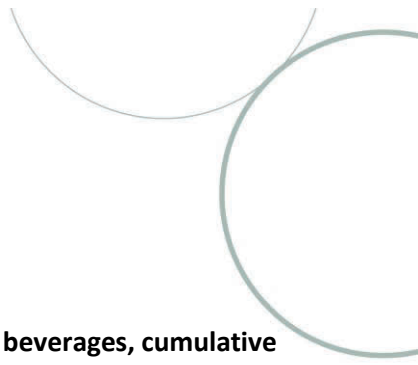


**Chart C5: CPI and LCI for low-paid employee households for Insurance and financial services, cumulative growth rates, December quarter 2017 to December quarter 2021**

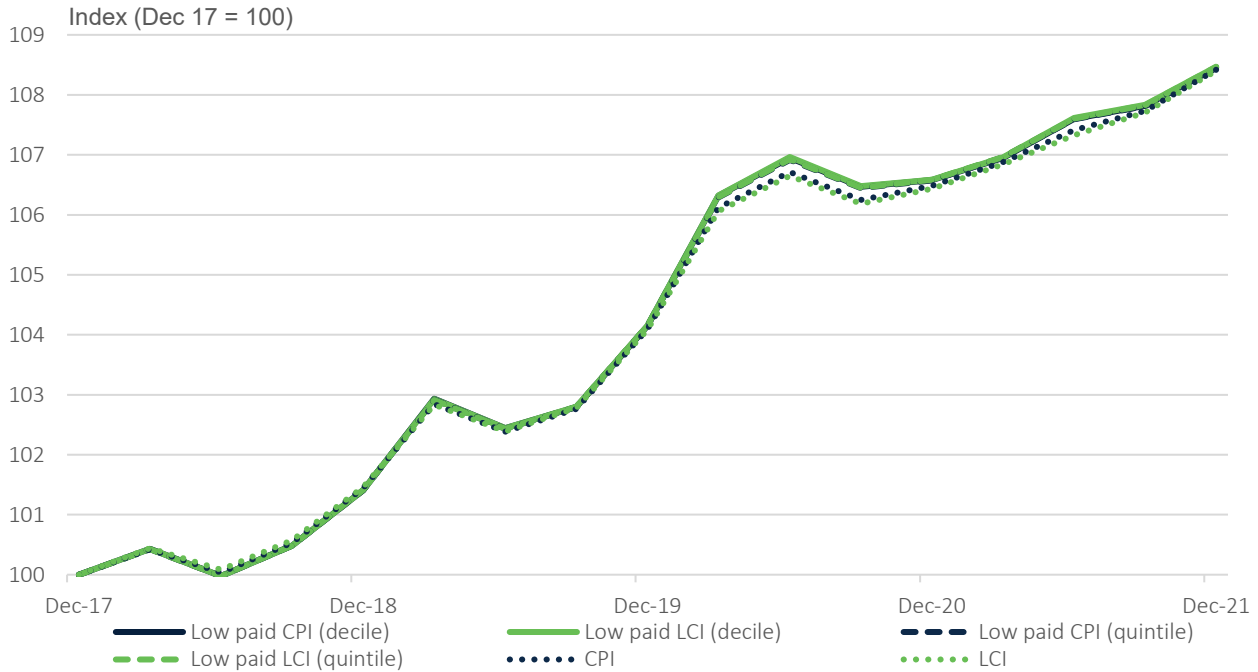


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

Charts C6 to C11 show the cumulative growth rates for the remaining expenditure groups, for which the low-paid employee household measures of the LCI and CPI did not vary significantly from the published LCI and CPI.



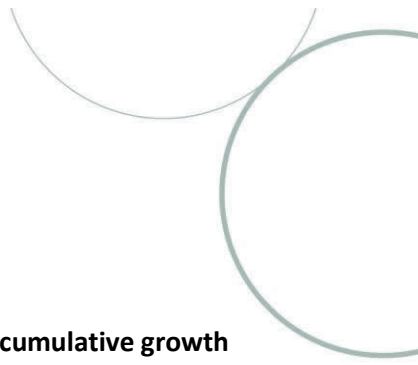
**Chart C6: CPI and LCI for low-paid employee households for Food and non-alcoholic beverages, cumulative growth rates, December quarter 2017 to December quarter 2021**



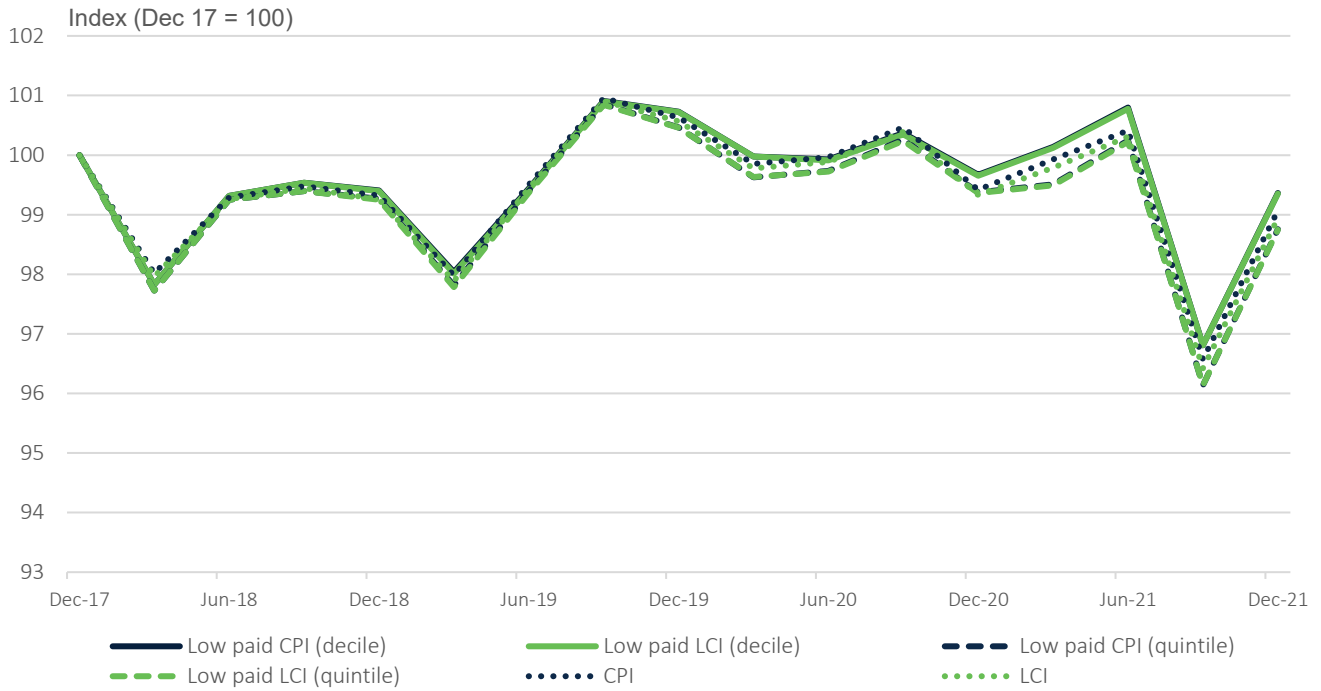
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



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**Chart C7: CPI and LCI for low-paid employee households for Clothing and footwear, cumulative growth rates, December quarter 2017 to December quarter 2021**

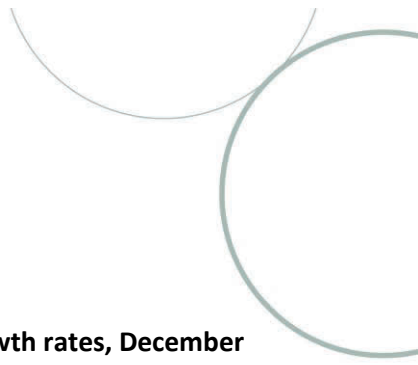


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.

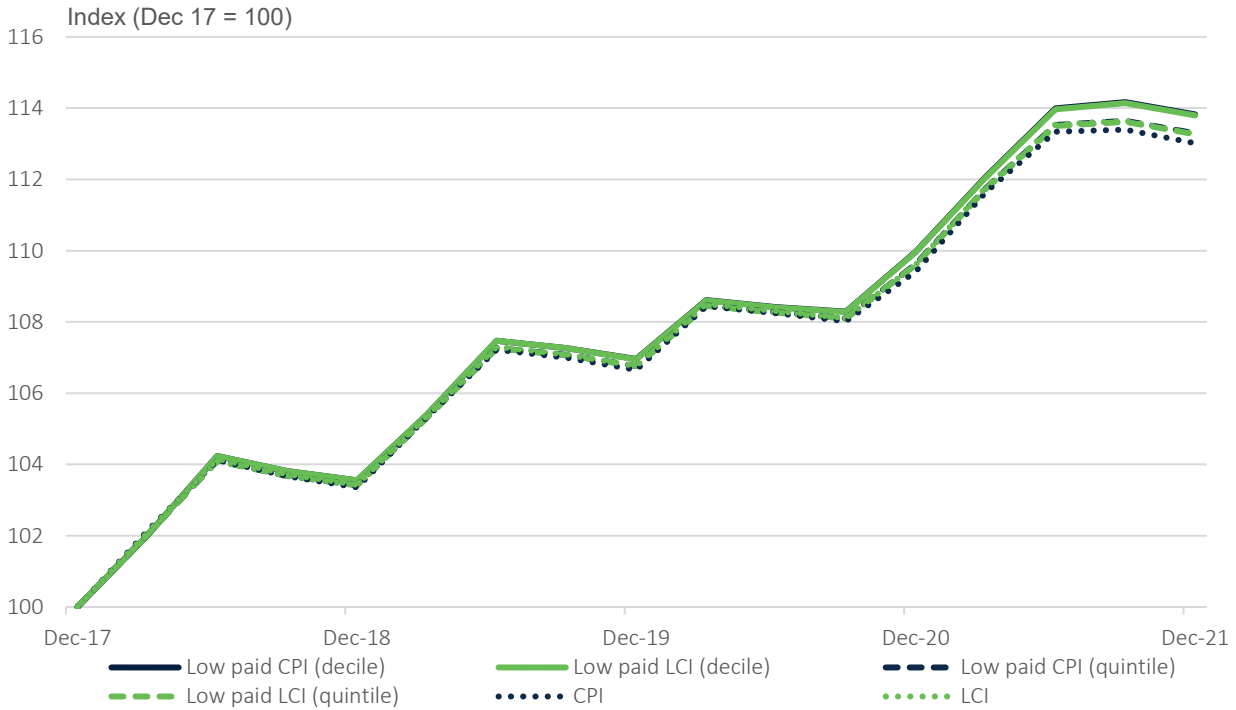




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**Chart C8: CPI and LCI for low-paid employee households for Health, cumulative growth rates, December quarter 2017 to December quarter 2021**



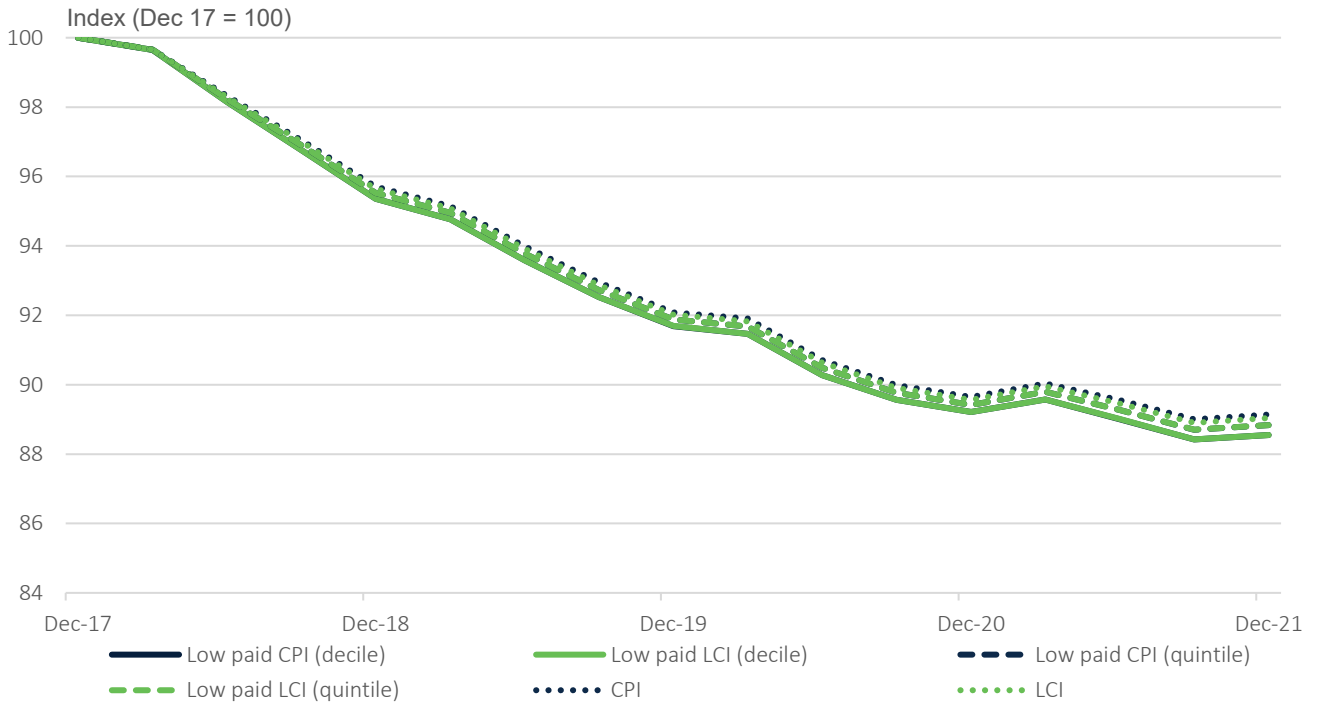
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



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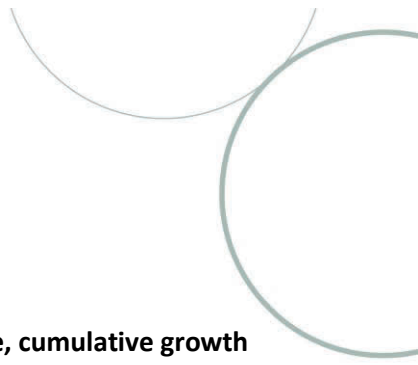
**Chart C9: CPI and LCI for low-paid employee households for Communication, cumulative growth rates, December quarter 2017 to December quarter 2021**



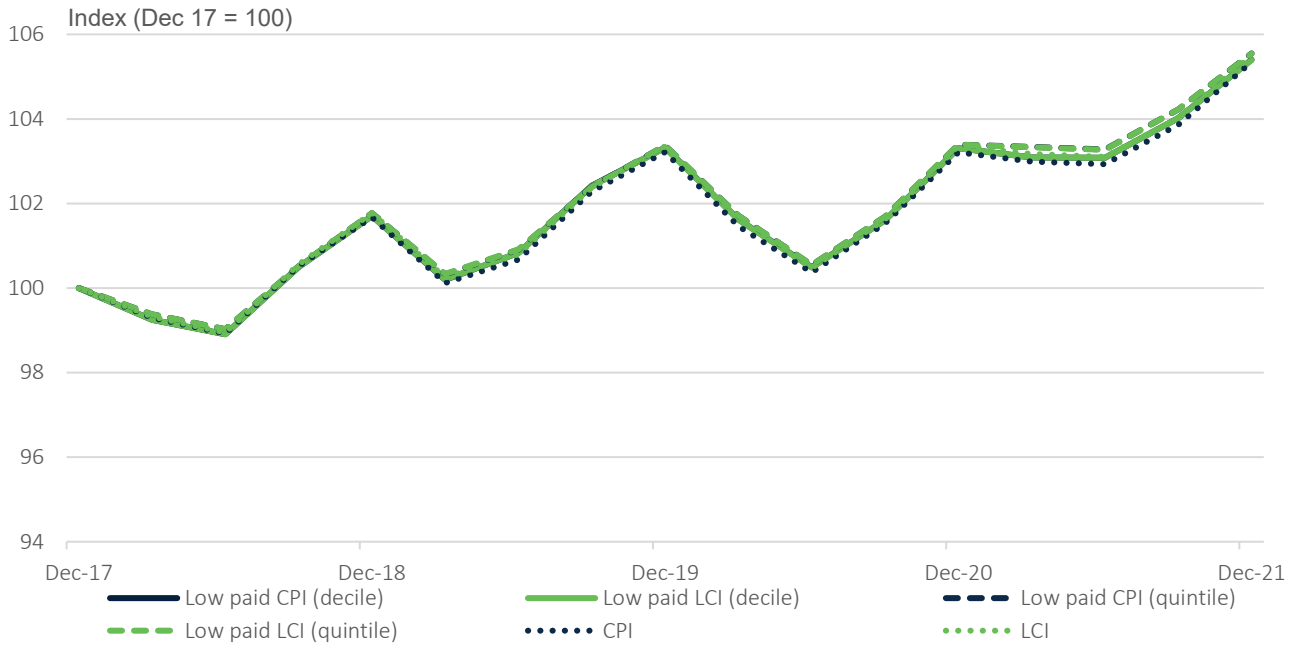
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



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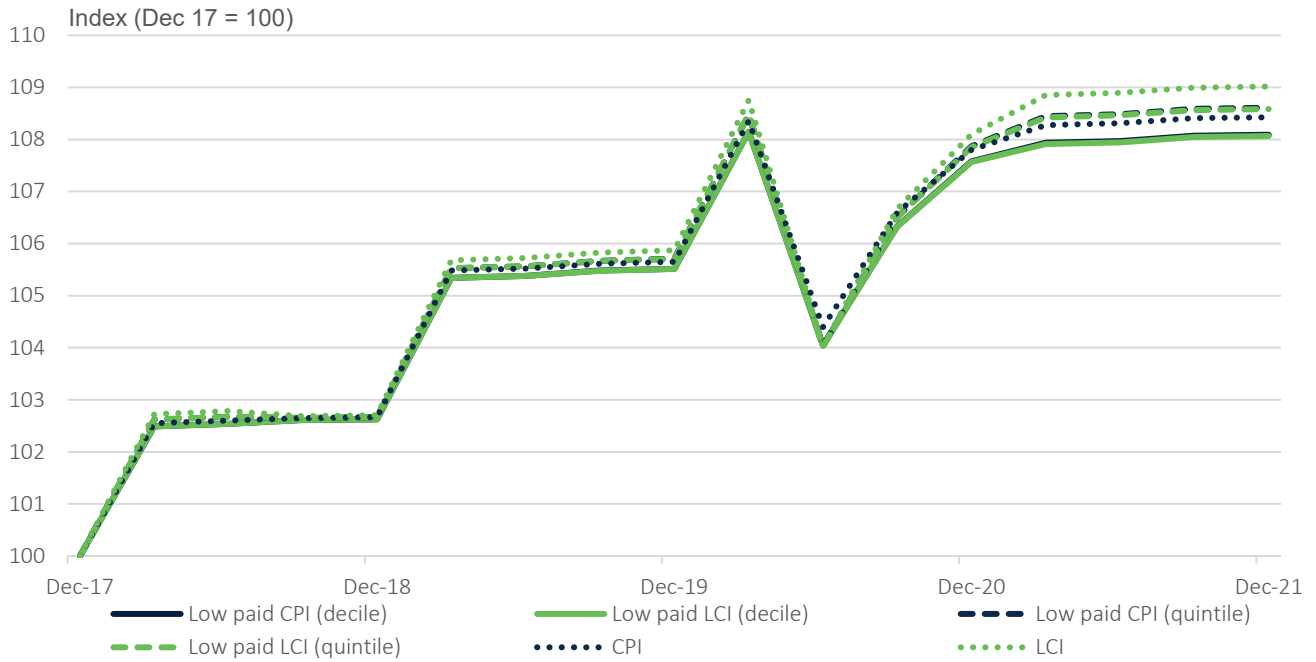
**Chart C10: CPI and LCI for low-paid employee households for Recreation and culture, cumulative growth rates, December quarter 2017 to December quarter 2021**



Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



**Chart C11: CPI and LCI for low-paid employee households for Education, cumulative growth rates, December quarter 2017 to December quarter 2021**

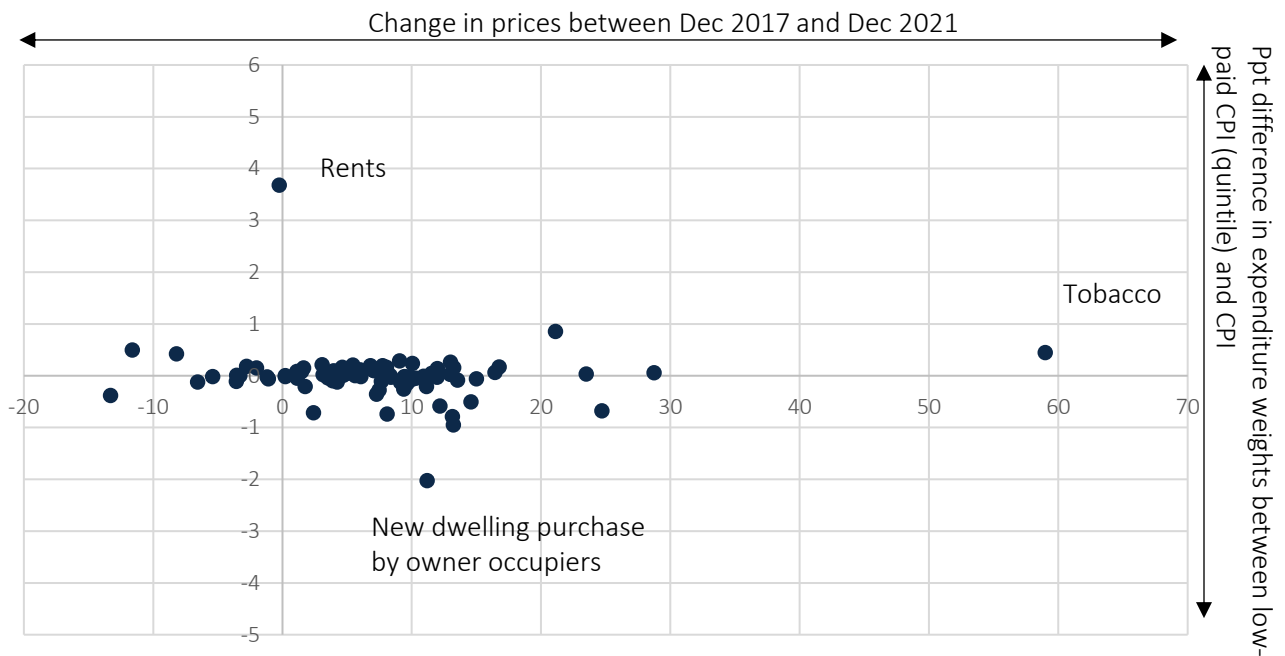


Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



# Appendix D: Effects of expenditure and price changes

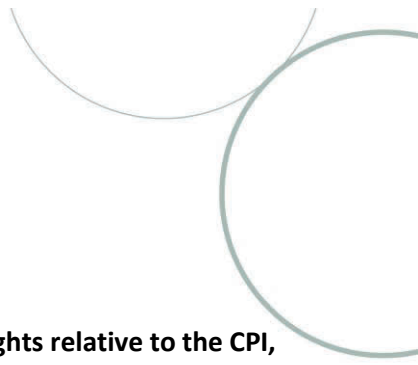
**Chart D1: Percentage point differences in the low-paid CPI (quintile) expenditure weights relative to the CPI, and changes in the CPI between the December quarter 2017 and December quarter 2021, by expenditure class**



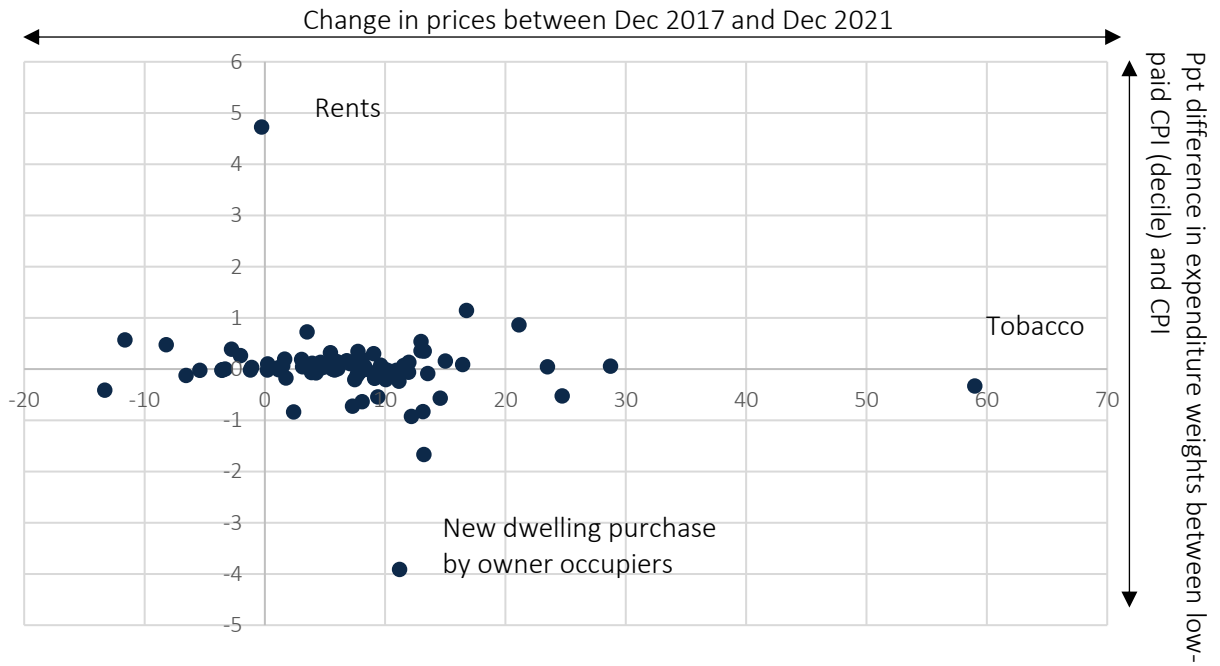
Source: ABS, Microdata: *Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*.



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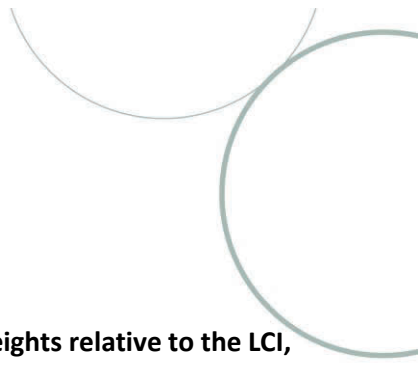
**Chart D2: Percentage point differences in the low-paid CPI (decile) expenditure weights relative to the CPI, and changes in the CPI between the December quarter 2017 and December quarter 2021, by expenditure class**



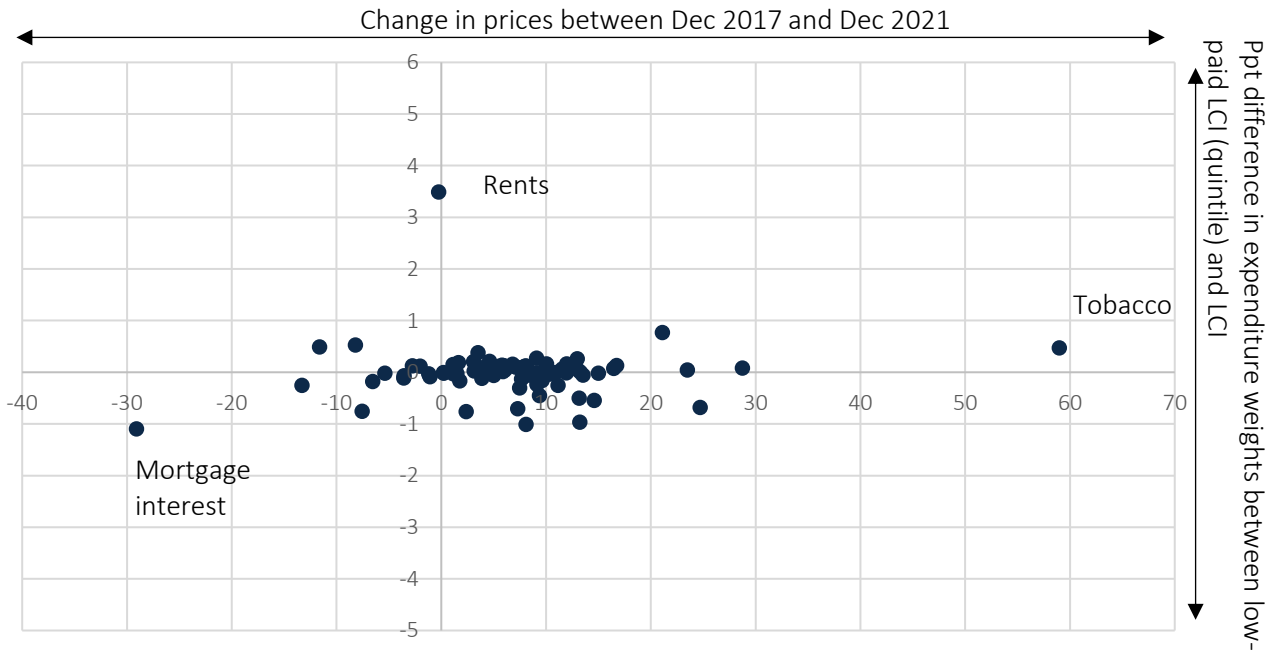
Source: ABS, Microdata: *Household Expenditure, Income and Housing*, 2015–16; ABS, *Consumer Price Index, Australia*, December 2021.



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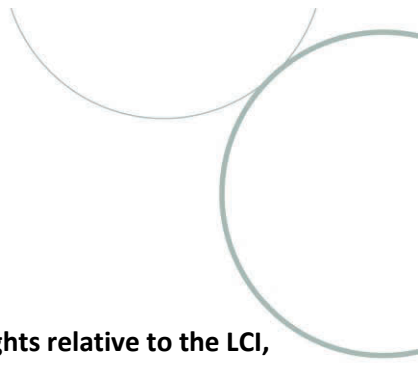
**Chart D3: Percentage point differences in the low-paid LCI (quintile) expenditure weights relative to the LCI, and changes in the LCI between the December quarter 2017 and December quarter 2021, by expenditure class**



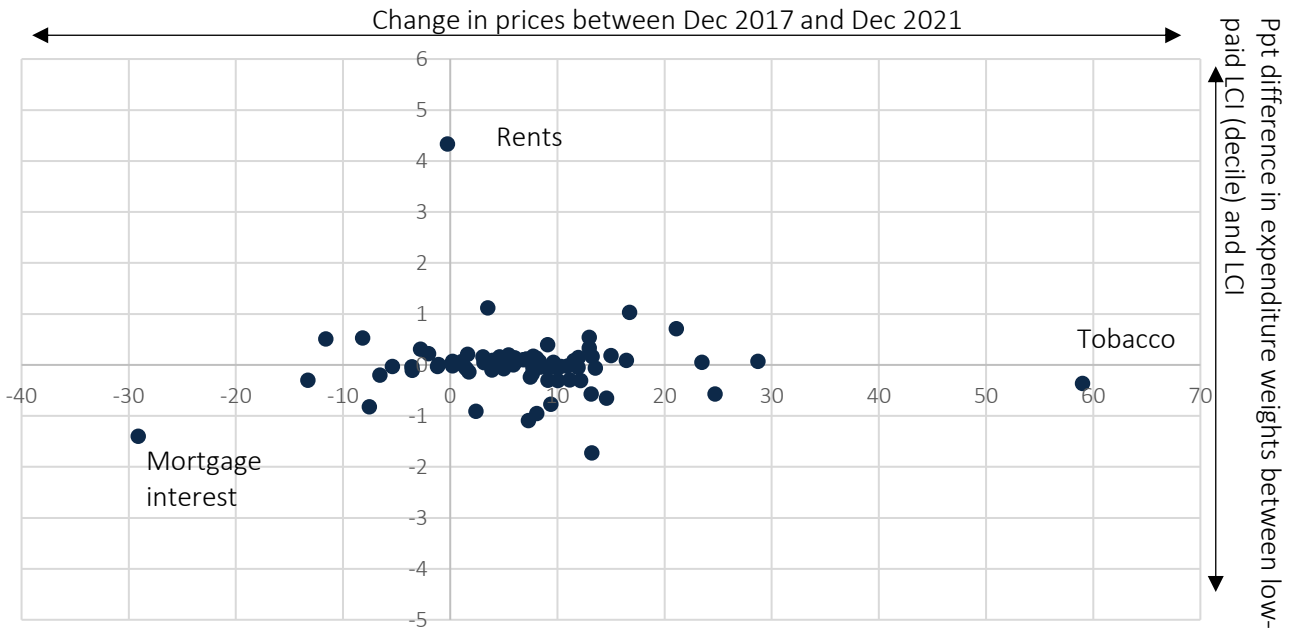
Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.



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**Chart D4: Percentage point differences in the low-paid LCI (decile) expenditure weights relative to the LCI, and changes in the LCI between the December quarter 2017 and December quarter 2021, by expenditure class**



Source: ABS, *Microdata: Household Expenditure, Income and Housing, 2015–16*; ABS, *Consumer Price Index, Australia, December 2021*; ABS, *Selected Living Cost Indexes, Australia, December 2021*.