Calculating Contributions of Product Categories to Percentage Changes in the Annually Chained Australian CPI

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Abstract: As of December quarter 2018, the Australian Bureau of Statistics will update the Expenditure Class (EC) weights of the CPI on an annual basis. In this paper, we discuss the decomposition of percentage changes in the chained CPI into contributions of the ECs. The main purpose is to derive an approximate expression for the annual rate of inflation that distinguishes between contributions due to percentage price changes of the ECs and changes in the weights. The approximation is illustrated using 10 years of expenditure data from the Australian National Accounts and officially published price index numbers.

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1. Introduction

As of December quarter 2018, the Australian Bureau of Statistics (ABS) will reweight the CPI on an annual basis, using weights at the Expenditure Class (EC) level derived from (preliminary) National Accounts Household Final Consumption Expenditure data. The idea is that annual updating the weights tends to reduce upper level substitution bias in the CPI (ILO et al., 2004). Some empirical evidence supporting this is presented in ABS (2016a).

CPI analysts and users may be interested in the contributions of the ECs to the change in the CPI, in particular quarterly and annual percentage changes. A number of methods to decompose the annual percentage change in the chained CPI (the annual rate of inflation) into contributions of products or product categories are already available, including the method used by Statistics Netherlands (Walschots, 2016) and the method recently proposed by Balk (2017). These methods measure the contributions of price changes of the product categories until and after the link period to avoid the impact of changes in the weights.[1]

Most likely, CPI analysts and users want to know the contributions of *annual percentage price changes* of the product categories to the annual inflation rate. In this case, changes in the weights come into play. The main purpose of this paper is to derive an (approximate) expression for the contributions of the ECs that distinguishes between the effects of annual percentage price changes and changes in the weights. Seperating the two effects is admittedly somewhat arbitrary, but we believe our approach is useful and provides additional insight.

Section 2 discusses the existing Australian CPI where the weights are fixed for several years, and shows how the contributions of the ECs to the quarterly and annual percentage CPI changes are currently calculated. Section 3 explains how the annually chained CPI will be constructed and shows that the contributions of the ECs to quarterly percentage changes of the chained CPI change can be calculated similar to how this has traditionally been done. Section 4 addresses the main issue and derives an approximate

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[1] Walschots (2016) compared the Dutch decomposition method with the method used by Eurostat for the Harmonized Index of Consumer Prices (HICP). His empirical results indicated that the two methods can yield quite different results. The Eurostat method is different in that it calculates the impact of a product category on the inflation rate by excluding that category and then comparing the resulting partial inflation rate to the official inflation rate. "The impact takes account of both the weight and whether the inflation for that sub-index is higher or lower than the all-items inflation rate", according to Eurostat. Previously, Ribe (1999) proposed another decomposition for the HICP.

decomposition for the annual rate of inflation which distinguishes between the effect of price changes of the ECs and the effect of changes in the weights. Section 5 applies the decomposition to the data used in ABS (2016a) to check the assumptions made. Section 6 concludes.

2. Current situation

The current Australian CPI is a *Lowe-type* price index. That is, the CPI is a price index where, at the upper level of aggregation, the price indexes of the product categories (in this case ECs) are aggregated using fixed weights that have been *price-updated*. Price updating is needed to express the ECs' expenditure shares, which pertain to some prior year, in prices of the index reference period.

The existing literature on the topic typically assumes that the CPI is a genuine Lowe index and derives decompositions in terms of prices and quantities of individual products. While this could simplify the exposition, it does not reflect what statistical agencies actually do: they construct unweighted indexes at the "elementary" level of aggregation because quantity information at the individual product level is generally not available.[2] In this paper, therefore, the decompositions will be derived in terms of price indexes and weights of product categories rather than prices and quantities of individual products.

The index reference period in the official CPI, which is a quarterly statistic, is a financial year; the Australian financial year runs from 1 July to 30 June. However, for convenience we will assume that the index reference period, i.e. the starting period of the time series where the CPI is equal to 1, is a quarter; this assumption does not really affect the analysis. More specifically, we act as if September quarter 2017, denoted by 2017*III*, was the new index reference period.

The fixed-weight, Lowe-type CPI going from the index reference period 2017*III* to quarter q $(q = I, II, III, IV)$ of year y $(y = 2018, 2019...)$ would then be

$$P^{2017III,yq} = \sum_{n=1}^{N} w_n^{2017III} P_n^{2017III,yq} , \tag{1}$$

[2] Current practice in the Australian CPI is the use of Jevons price indexes for most of the elementary aggregates, which are aggregated using Lowe-type weights (ABS, 2016b). Starting in December quarter 2017, the elementary aggregate indexes calculated from transactions data will be based on a weighted multilateral method (ABS, 2017). Note also that the weights were updated every year when data from the Household Expenditure Survey (HES) became available, i.e. at six year intervals.

where $P_n^{2017III,yq}$ is the price index of EC *n* and $w_n^{2017III}$ is the corresponding weight; *N* is the total number of ECs. The weights are expenditure shares in the financial year 2015-2016, $s_n^{2015-2016}$,[3] which are price updated to the index reference period, that is, expressed in prices of 2017*III*, and then normalized to add up to 1:

$$w_n^{2017III} = \frac{s_n^{2015-2016} P_n^{2015-2016,2017III}}{\sum_{n=1}^{N} s_n^{2015-2016} P_n^{2015-2016,2017III}}, \tag{2}$$

where $P_n^{2015-2016,2017III}$ is the price index of EC *n* between the financial year 2015-2016 and quarter 2017*III*.[4]

The absolute change of (1) between consecutive quarters, for example between 2018*II* and 2018*III*, is

$$P^{2017III,2018III} - P^{2017III,2018II} = \sum_{n=1}^{N} w_n^{2017III} \left(P_n^{2017III,2018III} - P_n^{2017III,2018II} \right), \tag{3}$$

and so the quarterly percentage change can be written as

$$\frac{P^{2017III,2018III}}{P^{2017III,2018II}} - 1 = \sum_{n=1}^{N} \frac{w_n^{2017III} P_n^{2017III,2018II}}{P^{2017III,2018II}} \left(P_n^{2018II,2018III} - 1 \right). \tag{4}$$

The term $[w_n^{2017III} P_n^{2017III,2018II} / P^{2017III,2018II}](P_n^{2018II,2018III} - 1)$ is called the contribution of an individual EC – or more precisely: the contribution of its quarterly percentage price change – to the quarterly percentage change of the all groups CPI. Notice that long-run price index series for all ECs should be available in order to be rescaled to any period, in equation (4) to calculate $P_n^{2018II,2018III} = P_n^{2017III,2018III} / P_n^{2017III,2018II}$.

The annual percentage change, or annual inflation rate, derived from the Lowe-type CPI has a similar structure. For example, the annual inflation rate between 2018*I* and 2019*I* can be written as

$$\frac{P^{2017III,2019I}}{P^{2017III,2018I}} - 1 = \sum_{n=1}^{N} \frac{w_n^{2017III} P_n^{2017III,2018I}}{P^{2017III,2018I}} \left(P_n^{2018I,2019I} - 1 \right), \tag{5}$$

where $[w_n^{2017III} P_n^{2017III,2018I} / P^{2017III,2018I}](P_n^{2018I,2019I} - 1)$ is the contribution of an individual EC.

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[3] The expenditure shares for 2015-2016 will be based on data from the HES, as in the past. When the CPI weights are updated, they will be based on National Accounts Household Final Consumption Expenditure information.

[4] Usually an arithmetic average of the four quarterly indexes is taken to calculate an annual average index level. This is what we will do as well in the empirical section 5.

3. Annual reweighting and chaining

The idea is to construct short-term CPI series and chain-link them in a particular quarter of each year. More specifically, the short-term series start in September quarter of each year, *yIII* and end in September quarter of the following year, *y*+1,*III*. "Starting period" is now a better name than "index reference period" – we will use the latter name for the starting period of the chained CPI, September quarter 2017. The September quarter also acts as the link period in which the short-term series are chain-linked to obtain the long-run CPI time series. Each short-term CPI series is based on the Lowe-type formula (1), albeit only for five quarters (with the price indexes in the starting period being equal to 1).

It will be useful to explain annual chaining formally for just two short-term CPI series, hence with a single link period; the generalisation to multiple short-term series is straightforward. The first short-term series is given by

$$P^{2017III,yq} = \sum_{n=1}^{N} w_n^{2017III} P_n^{2017III,yq}, \tag{6}$$

with *yq* running from 2017*III* to 2018*III*, and where the weights in equation (6) are given by (2).

The second short-term series is given by

$$P^{2018III,yq} = \sum_{n=1}^{N} w_n^{2018III} P_n^{2018III,yq}, \tag{7}$$

with *yq* running from 2018*III* to 2019*III* . The weights now refer to expenditure shares for the financial year 2016-2017, $s_n^{2016-2017}$, which are price updated to 2018*III* and again normalized:

$$w_n^{2018III} = \frac{s_n^{2016-2017} P_n^{2016-2017,2018III}}{\sum_{n=1}^{N} s_n^{2016-2017} P_n^{2016-2017,2018III}}, \tag{8}$$

where $P_n^{2016-2017,2018III}$ is the price index of EC *n* between the financial year 2016-2017 and quarter 2018*III*.

The chained CPI for $yq = 2018III,...,2019III$ becomes

$$P_C^{2017III,yq} = P^{2017III,2018III} \times P^{2018III,yq}. \tag{9}$$

Each quarterly percentage change of the chained CPI utilizes a single set of weights. For example, the quarterly change between 2018*II* and 2018*III* is based on the first short-term series and can be written as

$$\frac{P_C^{2017III,2018III}}{P_C^{2017III,2018II}} - 1 = \sum_{n=1}^{N} \frac{w_n^{2017III} P_n^{2017III,2018II}}{P^{2017III,2018II}} \left(P_n^{2018II,2018III} - 1 \right), \tag{10}$$

which is identical to expression (4). The next quarterly change, between 2018*III* and 2018*IV*, is based on the second short-term series and can be expressed as

$$\frac{P_C^{2017III,2018IV}}{P_C^{2017III,2018III}} - 1 = \sum_{n=1}^{N} \frac{w_n^{2018III} P_n^{2018III,2018III}}{P^{2018III,2018III}} \left(P_n^{2018III,2018IV} - 1 \right). \tag{11}$$

4. Decomposing annual percentage changes

In this section, an approximation will be derived for the contributions of the individual ECs to the annual percentage change of the chained CPI, or (annual) rate of inflation, in which a distinction is made between the effects due to annual percentage price changes of the ECs and changes in their weights. Chaining is a multiplicative operation. Due to the arithmetic form of the short-term price index series, the contributions of the ECs do not exactly add up to the inflation rate.

From (9) it follows that the ratio of the chained CPI (with index reference period 2017*III*) in, for example, 2019*I* and 2018 *I* is

$$\frac{P_C^{2017III,2019I}}{P_C^{2017III,2018I}} = \frac{P_C^{2017III,2019I}}{P^{2017III,2018I}} = \frac{P^{2017III,2018III}}{P^{2017III,2018I}} P^{2018III,2019I}, \tag{12}$$

where $P_C^{2017III,2018I}$ is equal to the direct index $P^{2017III,2018I}$. Equation (12) can be written as

$$\frac{P_C^{2017III,2019I}}{P_C^{2017III,2018I}} = \frac{P^{2017III,2019I}}{P^{2017III,2018I}} \left[\frac{P^{2018III,2019I}}{P^{2017III,2019I} / P^{2017III,2018III}} \right]. \tag{13}$$

The direct Lowe-type CPI with 2017*III* weights in (13), $P^{2017III,2019I}$, must be calculated in addition to the chained CPI.

Taking logarithms of both sides of (13) yields

$$\ln\left[\frac{P_C^{2017III,2019I}}{P_C^{2017III,2018I}} \right] = \ln\left[\frac{P^{2017III,2019I}}{P^{2017III,2018I}} \right] + \ln\left[\frac{P^{2018III,2019I}}{P^{2017III,2019I} / P^{2017III,2018III}} \right]. \tag{14}$$

For a close to 1, the usual approximation is $\ln a \simeq a - 1$. Applying this approximation to the left-hand side of (14) and both terms on the right-hand side, which are all expected to be close to 1, gives the following decomposition of the rate of inflation:

$$\frac{P_C^{2017III,2019I}}{P_C^{2017III,2018I}} - 1 \simeq \left[\frac{P^{2017III,2019I}}{P^{2017III,2018I}} - 1 \right] + \left[\frac{P^{2018III,2019I}}{P_{(2017III)}^{2018III,2019I}} - 1 \right], \tag{15}$$

with $P_{(2017III)}^{2018III,2019I} = P^{2017III,2019I} / P^{2017III,2018III}$ for short.

The first component on the right-hand side of (15) equals the annual percentage change in the Lowe-type CPI based on fixed 2017*III* weights. This annual percentage change was already discussed in section 2 and can be decomposed into contributions of the ECs using equation (5). We would expect it in general to be slightly bigger than the annual inflation rate based on the chained index, because annual updating the weights most likely lowers measured inflation. Hence, we expect the second component on the right-hand side of (15) generally to be negative but small.

The ratio in the second component of (15) divides the Lowe-type price index $P^{2018III,2019I}$, which is going from 2018*III* to 2019*I* and based on 2018*III* weights, by the rescaled price index $P_{(2017III)}^{2018III,2019I}$. The latter index is going from 2018*III* to 2019*I* as well but is based on 2017*III* weights. It can also be expressed as a Lowe-type price index:

$$P_{(2017III)}^{2018III,2019I} = \frac{\sum_{n=1}^{N} s_n^{2015-2016} P_n^{2015-2016,2018III} P_n^{2018III,2019I}}{\sum_{n=1}^{N} s_n^{2015-2016} P_n^{2015-2016,2018III}} = \sum_{n=1}^{N} \tilde{w}_n^{2018III} P_n^{2018III,2019I}, \tag{16}$$

where

$$\tilde{w}_n^{2018III} = \frac{s_n^{2015-2016} P_n^{2015-2016,2018III}}{\sum_{n=1}^{N} s_n^{2015-2016} P_n^{2015-2016,2018III}}. \tag{17}$$

To decompose the second component of (15) into contributions of the ECs, it is convenient to write this component as

$$\frac{1}{P_{(2017III)}^{2018III,2019I}} \left[\left(P^{2018III,2019I} - 1 \right) - \left(P_{(2017III)}^{2018III,2019I} - 1 \right) \right]. \tag{18}$$

Substituting (16) and $P^{2018III,2019I} = \sum_{n=1}^{N} w_n^{2018III} P_n^{2018III,2019I}$ into the bracketed term of (18) and using $\sum_{n=1}^{N} w_n^{2018III} = \sum_{n=1}^{N} \tilde{w}_n^{2018III} = 1$, we obtain

$$\frac{P^{2018III,2019I}}{P_{(2017III)}^{2018III,2019I}} - 1 = \sum_{n=1}^{N} \frac{\left(w_n^{2018III} - \tilde{w}_n^{2018III} \right)}{P_{(2017III)}^{2018III,2019I}} \left(P_n^{2018III,2019I} - 1 \right). \tag{19}$$

From equations (5) and (19) it follows that approximation (15) can be written as

$$\begin{aligned} \frac{P_C^{2017III,2019I}}{P_C^{2017III,2018I}} - 1 \approx & \sum_{n=1}^{N} \frac{w_n^{2017III} P_n^{2017III,2018I}}{P^{2017III,2018I}} \left(P_n^{2018I,2019I} - 1 \right) \\ & + \sum_{n=1}^{N} \frac{\left(w_n^{2018III} - \tilde{w}_n^{2018III} \right)}{P_{(2017III)}^{2018III,2019I}} \left(P_n^{2018III,2019I} - 1 \right). \end{aligned} \tag{20}$$

Thus,

$$\frac{w_n^{2017III} P_n^{2017III,2018I}}{P^{2017III,2018I}}\left(P_n^{2018I,2019I}-1\right)+\frac{\left(w_n^{2018III}-\tilde{w}_n^{2018III}\right)}{P_{(2017III)}^{2018III,2019I}}\left(P_n^{2018III,2019I}-1\right) \quad (21)$$

can be called the (approximate) contribution of an individual EC to the annual inflation rate.

The first part of (21) measures the contribution of *n* due to its annual percentage price change, based on weights $w_n^{2017III}$ that are kept fixed. At the link period 2018*III*, however, the weights in the chained CPI most likely have changed.The second part of (21) adjusts *n*'s percentage price change between 2018*III* and 2019*I*, $P_n^{2018III,2019I}$, for the change in weights. Recall that $w_n^{2018III}$, given by (18), is the expenditure share of *n* in the financial year 2016-2017, price updated to 2018*III* (and normalized). Recall further that $\tilde{w}_n^{2018III}$, given by (17), is the expenditure share of *n* in the previous financial year, 2015-2016, which is also price updated to 2018*III* (and normalized). That is, the expenditure shares in the adjacent financial years have been made "comparable" by price updating them to the link period 2018*III*.

As the expenditure shares are price updated to the link period, the second part of expression (21) should reflect the impact of *relative quantity changes*. We will illustrate this as follows. Let $v_n^{2015-2016}$ and $v_n^{2016-2017}$ be the value of consumer expenditures on *n* in 2015-2016 and 2016-2017. The implicit quantity index of *n* between these two years, $Q_n^{2015-2016,2016-2017}$, is defined as the value index, $v_n^{2016-2017}/v_n^{2015-2016}$, divided by the price index $P_n^{2015-2016,2016-2017}$. So we have $v_n^{2016-2017}=v_n^{2015-2016}Q_n^{2015-2016,2016-2017}P_n^{2015-2016,2016-2017}$ or $s_n^{2016-2017}=v_n^{2015-2016}Q_n^{2015-2016,2016-2017}P_n^{2015-2016,2016-2017}/\sum_{n=1}^{N}v_n^{2016-2017}$. Substituting this result into (8) and dividing the numerator and denominator by $\sum_{n=1}^{N}v_n^{2015-2016}$ yields

$$w_n^{2018III}=\frac{s_n^{2015-2016}Q_n^{2015-2016,2016-2017}P_n^{2015-2016,2016-2017}}{\sum_{n=1}^{N}s_n^{2015-2016}Q_n^{2015-2016,2016-2017}P_n^{2015-2016,2016-2017}}. \quad (22)$$

A comparison of (22) with (17) shows that $w_n^{2018III}$ is the "quantity updated' version of $\tilde{w}_n^{2018III}$. Notice that if the quantity indexes $Q_n^{2015-2016,2016-2017}$ are the same for all *n*, then $w_n^{2018III}=\tilde{w}_n^{2018III}$ so that the second part of (21) is equal to 0.

A number of points are worth noting. While the purpose of annual updating of weights is to reduce upper level substitution bias in the CPI, the second component of (15) should not be viewed as the effect of upper level substitution on measured inflation – it measures a *lagged* effect. Note further that relative quantity changes may not only be due to relative price changes of the product categories; they can have other causes as well. As we will see, our data set contains some examples of such unexpected quantity changes.

The derivation of (15) stems from the simple idea that the effect of price changes can be measured by holding quantities, i.e. price-updated expenditure shares, constant and that the effect of relative quantities can be measured by holding prices constant. To derive (15), we used the price-updated expenditure shares of 2015-2016 to measure the price effect, but we could also have used those of 2016-2017. Our choice was motivated by the fact that it is a rather natural interpretation of “holding quantities constant”, and that it leads to an expression similar to the one used for the current fixed-weight Lowe-type CPI.

We focused on the contributions of ECs to changes in the chained overall CPI, i.e. the contributions of product categories at the lowest level of aggregation where the weights will be updated annually. In practice, however, the ABS also publishes price indexes at intermediate aggregation levels – for groups and subgroups – where chaining is required as well. The ABS will therefore follow a stepwise approach to calculating contributions: changes in the chained overall CPI are decomposed into contributions of the groups (rather than ECs), changes in the chained group indexes into contributions of the subgroups, and changes in the chained subgroup indexes into contributions of the ECs. The latter will be calculated for internal analytic purposes only.

Lowe-type indexes are consistent in aggregation, but consistency is lost due to chaining. Consequently, the (published) contribution of, for example, a particular group to the annual rate of inflation is not necessarily equal to the sum of the (unpublished) contributions to the rate of inflation of the constituent subgroups, or ECs, which can of course be calculated. In section 5 below, we present some evidence on this.

5. Empirical evidence

In this section, a simulation on real data is conducted. One of the aims is to examine if the linearization of the left-hand side of equation (14) and the linearizations of the two factors on the right-hand side, which lead to approximation (15) of the annual inflation rate derived from the chained CPI, work satisfactorily. If this turns out to be the case, we can have some confidence in the approximate contributions of the ECs, given by equation (21).

The expenditure information is the same as was used in ABS (2016a). It spans 10 financial years, starting in 2004-2005 and ending in 2013-2014. While Household

Final Consumption Expenditure (HFCE) data from the National Accounts is the primary source,[5] some adjustments had to be made to meet CPI requirements. In particular, the Deposit and Loans EC was excluded because the coverage of financial services in the 16th CPI series was restricted to direct fees. The (price-updated) expenditure shares used are shown in the Appendix. The quarterly price indexes for the resulting 86 ECs are the officially published ones; they can be downloaded from the ABS website.

Figure 1, borrowed from ABS (2016a), shows the CPI (excluding Deposit and Loans), the annually chained CPI, and the Fisher price index. A comparison with the Fisher index suggests that upper level substitution bias in the fixed-weight CPI amounts to +1.7 percentage points across the six year period, i.e. on average +0.24 percentage points per year when measured in compound annual growth rates. As expected, annual chaining lowers measured inflation; the average annual growth rate of the chained CPI is only +0.09 percentage points higher than that of the Fisher index.

Figure 2 shows the results for equation (15) that decomposes the inflation rate based on the annually chained CPI into the combined contributions of price changes of all the ECs (component 1) and the combined contributions of relative quantity changes (component 2). Component 2 is indeed small and generally negative, on average -0.02 percentage points.

Figure 3 compares the sum of the two components with the actual percentage change in the annually chained CPI. The two lines are very similar, so approximation (15) of equation (14) works reasonably well.

Figures 4 and 5 plot the results for equation (21) for four ECs. Figure 4 shows the total contribution of each EC to the annual inflation rate. It illustrates that some of the contributions can be large and erratic. For example, the contribution for Automotive fuel is +0.92 in September quarter 2008 and -0.70 in June quarter 2009; the annual inflation rate was 4.08% and 2.61%, respectively.

The contributions are largely driven by price changes (component 1), as Figure 5 shows for the four selected ECs. In some cases there is a noticeable effect of relative quantity changes (component 2), like in June quarter 2011 for Fruit and in September quarter 2011 for Medical and hospital services, in line with a sudden sharp increase of the price-updated expenditure shares; see the Appendix.

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[5] The HFCE data refer to *preliminary estimates*. These estimates are revised the next year; final figures are published a year later. For the reasons behind using preliminary rather than revised or final HFCE data as weighting information in the chained CPI, see ABS (2016a).

Figure 1: CPI, annually chained CPI and Fisher index

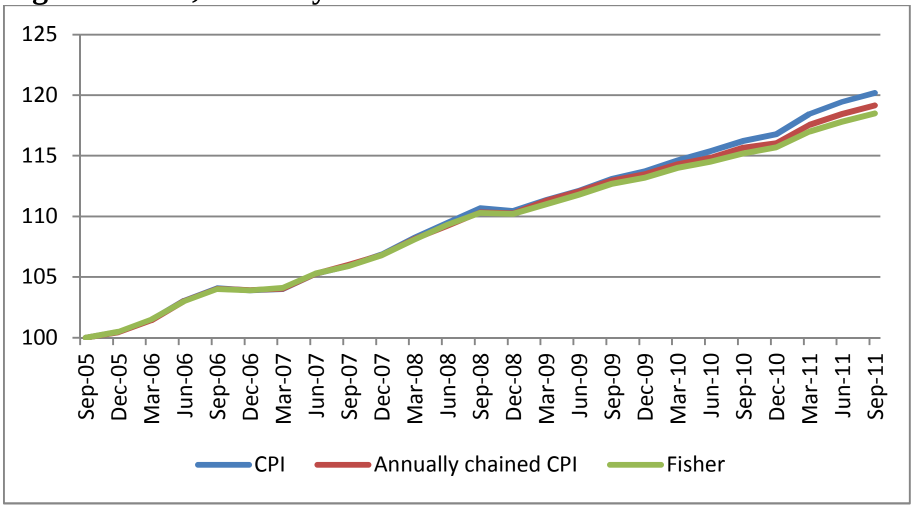


Figure 2: Components of equation (15)

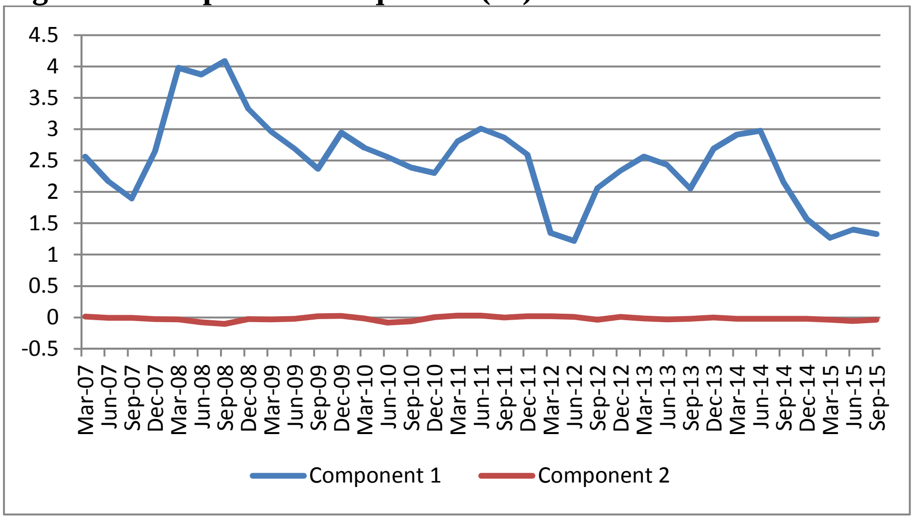


Figure 3: Sum of components of (15) and actual inflation rate

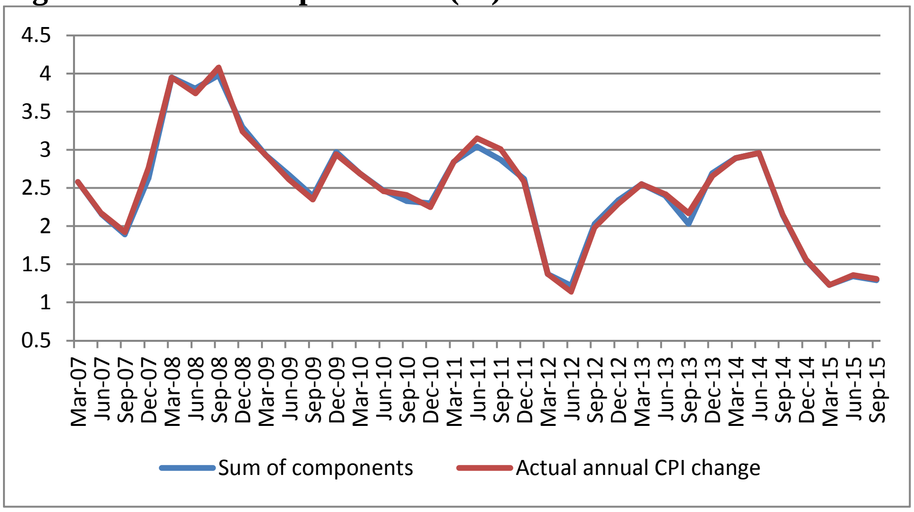


Figure 4: Contributions of selected ECs to annual inflation rate

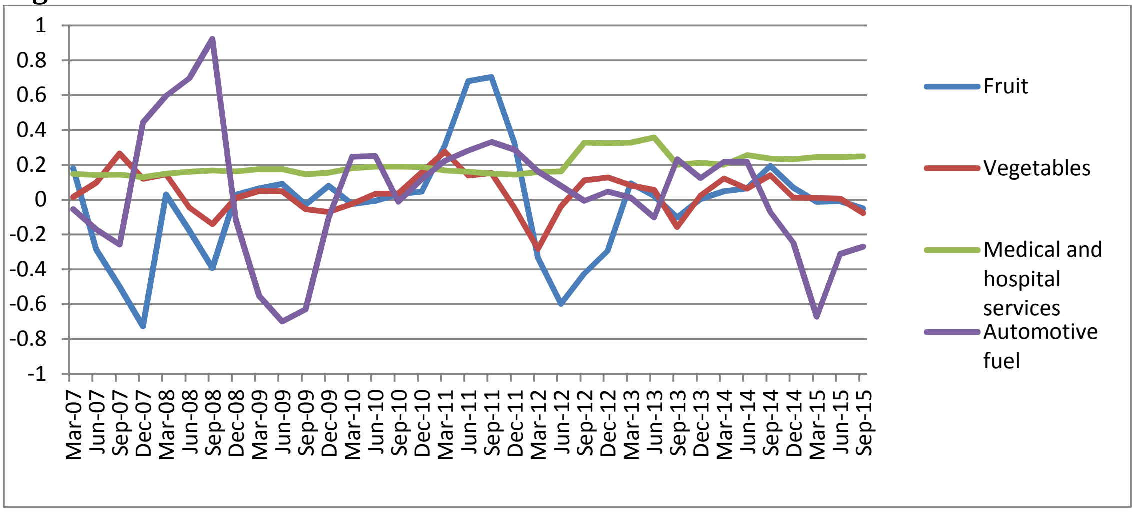
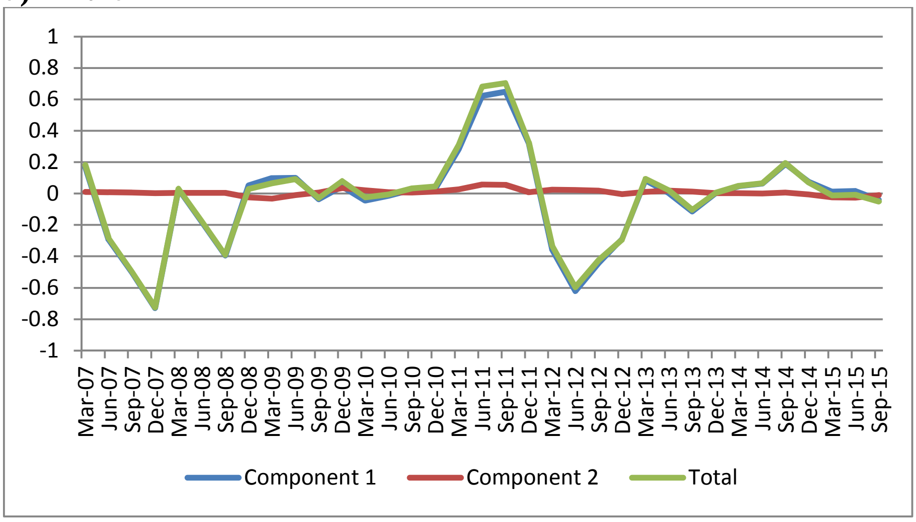
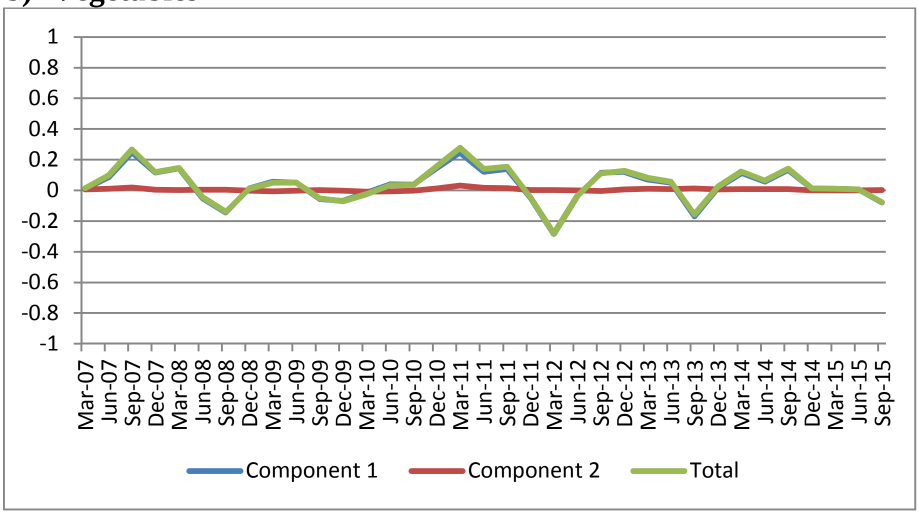


Figure 5: Decompositions of contributions for selected ECs

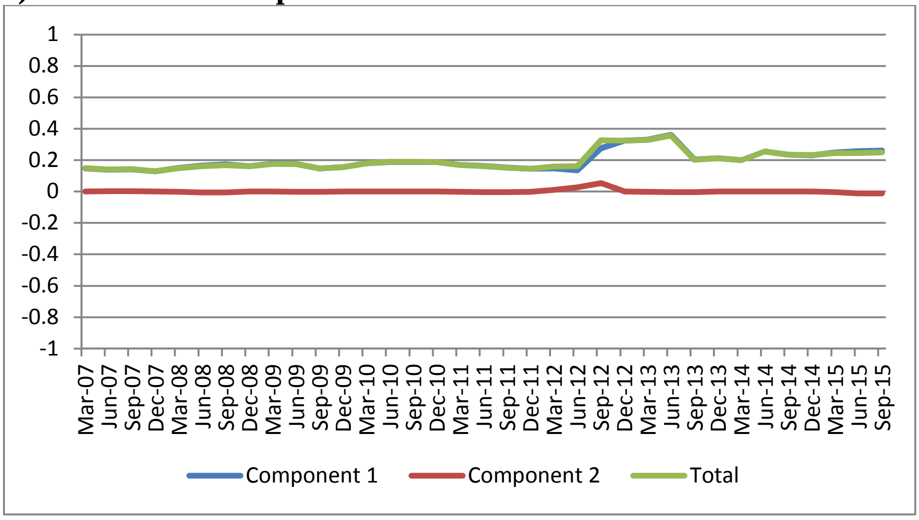
a) Fruit



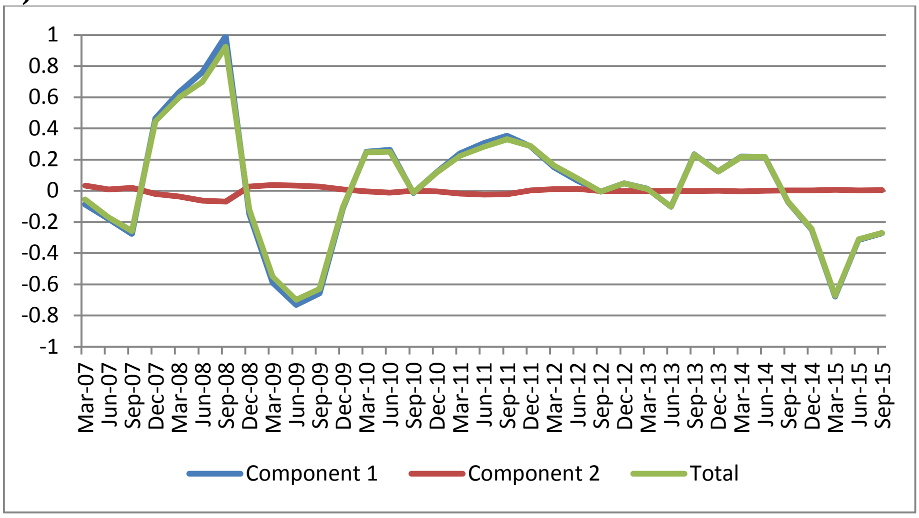
b) Vegetables



c) Medical and hospital services



d) Automotive fuel



Additional calculations: contributions of Groups to annual change in (chained) CPI, split into price and quantity effects.

6. Summary and conclusions

Updating the EC weights and chain-linking the short term CPI series in the September quarter of each year does not pose any new problems for calculating contributions of the ECs to quarterly percentage changes of the chained CPI because changes in weights do not come into play. The contributions add exactly up to the quarterly CPI change and are calculated in a similar way as has been done for the Lowe-type CPI with weights that were kept fixed for six years.

The main aim of this paper was to derive an approximation of the contributions of the ECs to the annual inflation rate that distinguishes between contributions due to percentage price changes of the ECs and contributions due to changes in the weights or, put differently, due to relative quantity changes. To make the analysis more readable, an example was used; generalising the example is straightforward. A simulation using National Accounts expenditure data and officially published prices indexes showed that the decomposition works well. The ABS intends to use this decomposition for internal analytical purposes and to inform users.

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Appendix: Price-updated expenditure shares used

Table A.1: Price-updated expenditure shares (in %)*

Expenditure Class (EC)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bread	0.78	0.82	0.83	0.86	0.84	0.83	0.74	0.75	0.77	0.76
Cakes and biscuits	0.60	0.61	0.61	0.64	0.63	0.64	0.60	0.58	0.59	0.59
Breakfast cereals	0.23	0.24	0.23	0.23	0.22	0.23	0.22	0.22	0.22	0.21
Other cereal products	0.26	0.25	0.26	0.29	0.29	0.26	0.24	0.24	0.25	0.24
Beef and veal	0.36	0.35	0.33	0.33	0.34	0.36	0.31	0.33	0.32	0.35
Pork	0.33	0.32	0.32	0.31	0.34	0.34	0.31	0.30	0.31	0.32
Lamb and goat	0.18	0.17	0.17	0.17	0.18	0.18	0.17	0.15	0.14	0.16
Poultry	0.59	0.55	0.62	0.68	0.63	0.64	0.60	0.57	0.62	0.61
Other meats	0.31	0.31	0.32	0.32	0.34	0.34	0.32	0.32	0.29	0.32
Fish and other seafood	0.50	0.51	0.52	0.52	0.55	0.55	0.49	0.49	0.50	0.49
Milk	0.66	0.65	0.66	0.71	0.64	0.66	0.56	0.58	0.61	0.63
Cheese	0.37	0.36	0.37	0.40	0.37	0.35	0.34	0.34	0.33	0.37
Ice cream and other dairy products	0.42	0.42	0.42	0.45	0.46	0.45	0.41	0.41	0.41	0.42
Fruit	1.11	2.02	1.45	0.87	1.05	1.15	1.79	1.00	0.96	1.35
Vegetables	1.24	1.39	1.61	1.34	1.19	1.31	1.39	1.37	1.29	1.35
Eggs	0.09	0.10	0.11	0.10	0.09	0.10	0.09	0.09	0.10	0.10
Jams, honey and spreads	0.17	0.17	0.17	0.17	0.18	0.17	0.16	0.17	0.16	0.18
Food additives and condiments	0.37	0.37	0.39	0.38	0.40	0.41	0.37	0.38	0.36	0.36
Oils and fats	0.32	0.33	0.33	0.34	0.33	0.32	0.29	0.29	0.30	0.30
Snacks and confectionery	1.14	1.13	1.10	1.12	1.17	1.21	1.12	1.10	1.07	1.07
Other food products n.e.c.	0.57	0.58	0.55	0.56	0.58	0.58	0.52	0.54	0.53	0.53
Coffee, tea and cocoa	0.24	0.25	0.24	0.24	0.25	0.25	0.22	0.24	0.23	0.23
Waters, soft drinks and juices	1.08	1.08	1.12	1.09	1.11	1.14	1.07	1.05	1.05	1.05
Restaurant meals	3.40	3.32	3.45	3.22	3.07	2.87	2.77	2.83	2.82	2.78
Take away and fast foods	2.58	2.54	2.53	2.51	2.51	2.47	2.38	2.45	2.43	2.36
Spirits	0.78	0.78	0.82	0.84	0.82	0.74	0.70	0.71	0.71	0.69
Wine	1.38	1.32	1.36	1.33	1.29	1.28	1.21	1.23	1.26	1.22
Beer	2.35	2.29	2.37	2.26	2.21	2.24	2.04	2.09	1.97	1.95
Tobacco	2.38	2.32	2.24	2.11	2.09	2.48	2.38	2.29	2.44	2.62
Garments for men	0.83	0.81	0.82	0.79	0.80	0.80	0.82	0.78	0.83	0.78
Garments for women	1.82	1.76	1.80	1.75	1.77	1.75	1.78	1.73	1.73	1.69
Garments for infants and children	0.57	0.56	0.56	0.52	0.54	0.53	0.53	0.52	0.54	0.53
Footwear for men	0.17	0.17	0.17	0.16	0.15	0.16	0.17	0.17	0.17	0.16
Footwear for women	0.42	0.42	0.41	0.39	0.39	0.39	0.41	0.42	0.41	0.38
Footwear for infants and children	0.17	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15
Accessories	0.69	0.69	0.72	0.73	0.77	0.71	0.77	0.73	0.77	0.70
Cleaning, repair and hire of clothing and footwear	0.15	0.14	0.15	0.15	0.15	0.17	0.19	0.19	0.19	0.19
Rents	5.20	5.03	5.41	5.60	5.83	5.99	5.94	6.05	6.02	6.05
New dwelling purchase	8.58	8.32	8.11	8.08	7.72	7.81	7.85	7.44	7.18	7.13

Maintenance and repair of the dwelling	2.70	2.57	2.54	2.37	2.36	2.40	2.24	2.24	2.14	2.18
Property rates and charges	1.27	1.25	1.29	1.27	1.30	1.36	1.35	1.38	1.44	1.47
Water and sewerage	0.93	0.93	0.93	0.99	1.10	1.16	1.25	1.28	1.20	1.18
Electricity	1.11	1.12	1.17	1.65	2.19	2.38	2.19	2.50	2.57	2.26
Gas and other household fuels	0.74	0.73	0.75	0.86	0.97	1.02	1.15	1.43	1.54	1.40
Furniture	1.81	1.84	1.72	1.70	1.82	1.77	1.42	1.38	1.34	1.32
Carpets and other floor coverings	0.25	0.24	0.31	0.31	0.34	0.31	0.25	0.24	0.23	0.23
Household textiles	0.43	0.43	0.40	0.37	0.38	0.36	0.39	0.40	0.47	0.44
Major household appliances	0.82	0.76	0.72	0.75	0.81	0.76	0.64	0.61	0.59	0.61
Small electric household appliances	0.38	0.38	0.38	0.40	0.44	0.42	0.36	0.34	0.32	0.32
Glassware, tableware and household utensils	0.56	0.58	0.55	0.52	0.51	0.50	0.51	0.50	0.46	0.45
Tools and equipment for house and garden	0.31	0.31	0.31	0.29	0.29	0.29	0.26	0.26	0.19	0.19
Cleaning and maintenance products	0.23	0.23	0.23	0.20	0.18	0.19	0.16	0.17	0.22	0.21
Personal care products	1.30	1.29	1.22	1.26	1.37	1.37	1.34	1.38	1.55	1.46
Other non-durable household products	1.31	1.33	1.27	1.27	1.35	1.31	1.08	1.05	1.10	1.05
Child care	0.34	0.38	0.27	0.16	0.20	0.21	0.49	0.53	0.54	0.56
Hairdressing and personal grooming services	0.67	0.69	0.74	0.73	0.75	0.73	0.78	0.76	0.73	0.70
Other household services	0.89	0.90	0.87	0.85	0.86	0.86	0.81	0.85	0.75	0.74
Pharmaceutical products	1.42	1.40	1.60	1.68	1.81	1.85	1.63	1.71	1.77	1.95
Therapeutic appliances and equipment	0.27	0.27	0.28	0.30	0.31	0.34	0.30	0.30	0.29	0.31
Medical and hospital services	2.56	2.66	2.65	2.69	2.79	2.86	3.49	3.69	3.82	3.78
Dental services	0.84	0.85	0.83	0.87	0.92	0.94	0.96	0.98	0.90	0.95
Motor vehicles	4.55	4.33	4.20	4.20	4.34	3.50	3.36	3.21	2.64	2.79
Spare parts and accessories for motor vehicles	1.03	1.03	0.95	0.94	0.98	0.85	0.77	0.78	0.89	0.87
Automotive fuel	3.86	3.79	3.19	3.69	2.60	2.37	2.97	2.89	2.97	2.80
Maintenance and repair of motor vehicles	1.87	1.82	1.76	1.77	1.84	1.81	1.76	1.85	1.85	1.75
Other services in respect of motor vehicles	1.46	1.42	1.48	1.47	1.43	1.54	1.65	1.68	1.72	1.76
Urban transport fares	0.74	0.73	0.71	0.72	0.75	0.73	0.70	0.76	1.19	1.19
Postal services	0.16	0.16	0.16	0.14	0.12	0.12	0.12	0.11	0.10	0.09
Telecommunication equipment and services	3.04	3.09	3.20	3.14	3.23	3.17	3.01	3.02	3.00	2.90
Audio, visual and computing equipment	1.31	1.43	1.46	1.46	1.50	1.47	1.37	1.33	1.43	1.32
Audio, visual and computing media and services	1.18	1.26	1.38	1.39	1.41	1.42	1.27	1.26	1.22	1.19
Books	0.46	0.43	0.41	0.39	0.38	0.38	0.39	0.37	0.37	0.35
Newspapers, magazines and stationery	1.20	1.15	1.12	1.04	1.05	1.02	0.82	0.88	0.92	0.84
Domestic holiday travel and accommodation	1.87	1.85	1.88	2.03	2.18	1.92	2.30	2.45	2.50	2.39
International holiday travel and accommodation	1.35	1.37	1.47	1.73	1.73	1.49	1.83	1.98	2.02	2.02
Equipment for sports, camping and open-air recreation	0.91	0.88	0.88	0.83	0.86	0.77	0.86	0.90	0.91	0.91
Games, toys and hobbies	0.59	0.55	0.56	0.56	0.59	0.59	0.66	0.60	0.61	0.63
Pets and related products	0.45	0.46	0.44	0.43	0.49	0.51	0.42	0.41	0.36	0.34
Veterinary and other services for pets	0.15	0.17	0.17	0.24	0.31	0.31	0.23	0.22	0.20	0.20

Sports participation	1.15	1.13	1.14	1.19	1.23	1.21	1.32	1.39	1.43	1.43
Other recreational, sporting and cultural services	1.21	1.20	1.08	1.13	1.21	1.20	1.43	1.47	1.42	1.44
Preschool and primary education	0.54	0.54	0.56	0.49	0.56	0.66	0.78	0.76	0.78	0.83
Secondary education	0.55	0.56	0.57	0.64	0.65	0.71	0.86	0.84	0.85	0.89
Tertiary education	1.85	1.78	1.83	1.68	1.56	1.80	2.14	1.91	1.97	2.04
Insurance	0.96	1.05	1.07	1.13	1.23	1.22	0.94	1.23	1.03	1.08
Other financial services	3.02	3.05	3.43	3.37	2.28	2.79	2.57	2.34	2.44	2.81

* Expenditure shares mainly from National Accounts HFCE data, price-updated to September quarter of the following year; years indicative of period when weights were applied (with linking in September quarters).