Consumer Prices Index and Retail Prices Index – analysing differences

Background
A new way of explaining the differences between the Consumer Prices Index (CPI) and Retail Prices Index (RPI) was implemented as table 4 in the Consumer price indices statistical bulletin published in July:


This note provides more details on the improved method. A brief description of the main differences between the CPI and RPI has also been published:


Before the release of the June figures in July, table 10 of the Consumer price indices statistical bulletin contained a breakdown of the differences between the CPI and RPI. The analysis was produced by calculating 12-month percentage changes of several aggregates and adding/subtracting them from the headline rates to calculate each component. The final column, ‘other differences and weights’, was calculated as a residual and, as such, was a balancing item in the analysis. The main limitation with the analysis was the fact that annual rates are not strictly additive and this made explaining shifts in the figures difficult.

Improved method
A better method of analysing the differences between the headline rates is to use ‘contributions’. A contribution gives an estimate of the effect of a particular component on the CPI or RPI 12-month rate. It depends on both the change in a component index and its weight in the all items indices. The formulae for calculating contributions to the CPI and RPI 12-month rates are published in the Consumer Price Indices Technical Manual:


Contributions for standard RPI groups and CPI divisions are calculated and published on a monthly basis in the statistical bulletin. For example, in June 2010 Transport contributed 1.40 percentage points to the 3.2 per cent CPI 12-month rate.

In terms of reconciling the headline CPI and RPI rates, an analysis of the differences can be produced by calculating the contribution components make to those rates. For example, it is possible to calculate the contribution of mortgage interest payments (MIPs) to the RPI headline rate. In June 2010, MIPs contributed 0.15 percentage points to the RPI headline rate of 5.0 per cent. As MIPs is excluded from the CPI, it has no contribution to that index, so the difference between the CPI and RPI headline rates arising from MIPs (and based on contributions) is 0 - 0.15 = -0.15 percentage points. This approach can be used for the other components in table 4 of the Consumer price indices statistical bulletin.
Data interpretation using the new method

The new analysis was first published as table 4 of the redesigned Consumer price indices statistical bulletin starting with the June 2010 figures. In June 2010, the gap between the CPI and RPI was -1.79 percentage points and the components of the table explain that difference:

- **mortgage interest payments** contributed 0.15 percentage points to the RPI but are excluded from the CPI, which explains the -0.15 in table 4

- in **other housing components**, the following items contributed to the RPI but are excluded from the CPI: house depreciation, council tax, estate agent fees and buildings insurance. Adding these effects together produces 0.56 which explains the -0.56 in the table

- in **other differences in coverage of goods and services**, the main differences between CPI and RPI relate to new cars, annual road fund licences, TV licenses, trades union subscriptions, university accommodation fees, foreign students’ university tuition fees, and unit trust and stockbrokers’ charges. In June, these contributed -0.07 to the difference between CPI and RPI

- the **formula effect** is described more fully in


but in summary it is the difference between the CPI and RPI arising from calculating the lowest level RPI aggregates using arithmetic means and the lowest level CPI aggregates using geometric means. The effect in table 4 is derived by recalculating the CPI using arithmetic means and subtracting the result from the actual CPI. In general, the geometric mean of a given set of values is lower than the corresponding arithmetic mean. This means that, for a given set of price relatives, the geometric mean formula used in the CPI will produce a lower estimate of price change for an elementary index than one based on an arithmetic mean. For this reason the formula effect is consistently negative. In June, it was -0.84 percentage points

- **other differences including weights** is then calculated as the residual of strictly additive components and therefore balances the table. In June, the contribution was -0.18. Some of the main contributors to the component tend to be differences in weights for insurance, petrol and oil, air fares, food and clothing and footwear

Advantages of the improved method

The advantages with using the new method include:

**Improved methodology:** a contributions approach is an improvement on using annual rates because the individual components are additive, unlike annual rates; the calculations take better account of the weights of each component in the analysis; the published figures better reflect their importance to the difference in the all items indices.

**Consistency:** the analyses in the statistical bulletin text and the detailed briefing note are based on contributions, and this change brings the table in line with that approach.

**Improved analysis:** the majority of internal ONS tools for analysis are based on contributions so by switching to a contributions approach, the ONS is able to analyse changes in more detail.

For further information, please email cpi@ons.gov.uk.