INFLATION INDICATORS

Introduction

The rate at which the prices of goods and services purchased in the UK are changing is measured by two main inflation indicators – the Retail Price Index (RPI) and the Consumer Price Index (CPI). This factsheet sets out the background to these two indices, differences in the methods they use to calculate inflation, recent developments in the publication of variations on the core indices and the implications for pay bargaining.

Background

RPI has been in existence as a measure of inflation since 1947. Its primacy as the UK’s most widely accepted indicator of changes in prices was unchallenged until the introduction of the Harmonised Index of Consumer Prices (HICP) in 1996.

Established in the wake of the 1992 Maastricht Treaty, which had set out a path toward European monetary union, the HICP was constructed on the basis of facilitating comparisons between the inflation rates of the European Union’s member states and judging whether states met the criteria for monetary convergence. Therefore, Eurostat specified legally binding methods for member states to calculate HICP and deliberately excluded owner occupier housing costs from the measure to avoid distortions caused by wide variations in patterns of housing expenditure across countries.

In 2003, the UK renamed its HICP as the Consumer Price Index and the Chancellor announced that the inflation target would be based on CPI rather than RPIX (RPI minus mortgage interest payments), which had formed the target rate since 1992. Since then, press coverage has given ever more prominence to CPI, to the point that RPI is now frequently omitted from much inflation reporting.

Calculating inflation

The Office of National Statistics (ONS) publishes RPI and CPI figures on a monthly basis through its website http://www.ons.gov.uk/ons/index.html

The ONS calculates both RPI and CPI by taking a typical basket of goods and services consumed by an average UK household, weighting the importance of the items within the basket according to typical household expenditure and measuring the average changes in the price of those goods and services over time to arrive at an index of inflation.

The data collection process for RPI and CPI involves obtaining around 180,000 price quotes each month for over 650 goods and services.
The main areas in which RPI and CPI differ is in whose expenditure they cover, what expenditure items they cover and the statistical techniques used for arriving at average price changes. These differences are set out below:

<table>
<thead>
<tr>
<th></th>
<th>CPI</th>
<th>RPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whose expenditure is included?</td>
<td>All UK households</td>
<td>UK households with the exception of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• top 4% of households by income and pensioner households where 75% of income derived from state pensions and benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Overseas visitors and persons living in institutions</td>
</tr>
<tr>
<td>What expenditure items are included?</td>
<td>All expenditure categories except costs associated with owner occupied housing, most crucially mortgage interest payments and council tax</td>
<td>All expenditure categories</td>
</tr>
<tr>
<td>What statistical technique is used to calculate average price changes?</td>
<td>Around two thirds of the index is calculated through the geometric mean, while the remainder is calculated through the arithmetic mean</td>
<td>The arithmetic mean</td>
</tr>
</tbody>
</table>

Therefore, the groups excluded in RPI calculations mean that it is more tightly focused than CPI on employees. In addition, the owner occupier housing costs excluded by CPI mean that RPI is also a much better measure of the full range of costs that face workers.

CPI is further damaged by the statistical technique known as the geometric mean, which is used to calculate average price changes for the majority of the index. The geometric mean has an inbuilt tendency to understate the value of price rises. Advocates of this approach argue that this under-estimation is justified on the basis that it allows for price substitution – the idea that households respond to rising prices by switching purchases to lower cost alternatives. However, although this is a valid issue for examining household expenditure patterns, it does not reflect inflation, ie by how much a typical basket of goods and services changes in value over a certain time period.

RPI is based on arithmetic measures and critics point out that in certain circumstances RPI can overstate inflation. However, comparison with cost of living indices (outlined later in this factsheet) provides no support to the idea that RPI overstates rises in costs faced by employees.

The appendix at the end of this factsheet sets out in more detail the mathematics of calculating inflation using the different methods of the two indices.
Publication of new indices

In 2012, the ONS conducted consultations on revising aspects of both CPI and RPI.

The CPI consultation came down in favour of publishing a new index that includes housing costs. These costs are included through a method called “rental equivalence,” which treats owner occupied housing as if it were part of the rental market. Consequently, the ONS now publishes a measure called CPIH alongside CPI.

The ONS then went on to conduct a consultation on the statistical methods used to calculate the RPI. UNISON submitted a response arguing for retention of the current methods based on the arithmetic mean and at the end of the consultation the ONS concluded that the current methods would be retained.

Despite this conclusion, the UK Statistics Authority (which oversees the work of the ONS) has gone on to derecognise the RPI as a “national statistic” on the basis that it does not meet all the requirements of the “code of practice for official statistics.” The implication of this is that RPI continues to be published on the basis of its former statistical methodology, but it is not given the same prominence in the monthly statistical inflation bulletin produced by the ONS.

In addition, alongside RPI the ONS now publishes a measure called RPIJ. This index calculates RPI using a geometric mean (the technique rejected by the consultation exercise). Over the last year, RPIJ has been running an average 0.4% lower than RPI.

However, the result of these changes is that CPI is treated by the press as the measure of inflation, with scant regard for any other changes. This prompted economist Kate Barker to conclude her official review of CPI by stating that “it would be highly unsatisfactory to continue for an extended period with a key inflation index which does not command high credibility with either the wider population or with the statistical community.” She then went on to express regret about the greater prominence given to CPI before its weaknesses had been addressed.

Uses of inflation indicators

When the CPI was introduced in 2003, the government made it clear that RPI would continue to be used as the index to which changes in benefits, tax credits and tax allowances would be linked.

However, this position was eroded by the current government when the index for uprating of benefits, tax credits and public service pensions was switched to CPI in April 2011.

Nonetheless, RPI remains in use for the indexing of private contracts, tax allowances and government gilts. However, for workers the key issue is that RPI continues to be used as a benchmark for the great majority of pay negotiations.
Using RPI in pay bargaining

The ever increasing prominence given to CPI over RPI and the move toward publishing of the alternative RPIJ inflation indicator may tempt some employers to advocate moving away from RPI as a benchmark for pay negotiations.

However, UNISON believes that RPI remains the best official indicator of the change in the cost of living faced by our members.

This position is based on the fact that:

- RPI is more closely tied to the inflation faced by employees than CPI;
- RPI includes the housing costs that form a major component of costs faced by most workers yet are omitted from CPI;
- RPI is not based on a statistical technique that understates inflation and skews the figures for CPI and RPIJ.

To check the latest RPI figures, take a look at UNISON’s Economic Material to Support Your Claims, which includes inflation trends and detailed breakdowns. This material provides data to compare pay awards against inflation rates and therefore work out the change in the value of real wages across a workplace.

The same source also highlights the ONS tool called the Personal Inflation Calculator, which enables a sample of case studies to be developed as part of a pay claim, showing an individual’s personal inflation rate against the national average.

Inflation for different income groups

ONS inflation indicators do not provide any breakdown of the different inflation rates that may be faced by different income groups. This is particularly problematic given that organisations such as the Institute of Fiscal Studies (IFS) have confirmed that the greater tendency of low income households to spend a higher proportion of their income on fuel and water means that, on average, lower income households have experienced higher inflation rates than higher-income households over the last decade. In 2014, the IFS followed up their earlier studies with a report that demonstrated that the lowest income fifth of households experiences an annual inflation rate 1% higher than the highest income fifth between 2008 and 2013.²

A further indicator of differences in inflation rates experienced by different income groups comes from the annual Croner Reward cost of living survey.³ This survey analyses the required income to maintain a family’s existing standard across eight income groups. The latest rates can be seen at Economic Materials to Support Pay Claims.

---

¹ Peter Levell and Zoe Oldfield, The spending patterns and inflation experience of low-income households over the past decade, Institute of Fiscal Studies, June 2011

² Institute of Fiscal Studies, Green Budget 2014

³ Croner Reward, Cost of Living Regional Comparisons, March 2012
The drawback with these figures is that they are historical and updated just annually, while extensive forecasts are available for inflation indicators that enable union pay negotiators to look at the likely rise in the cost of living facing workers for the pay round under negotiation. However, the historical figures demonstrate that the cost of living indicator has been running ahead of RPI for the last two years, contrary to claims that RPI overstates the rate of increase in prices faced by workers.
Example of statistical techniques used to calculate RPI and CPI

If three items start with an initial price of 100p and their prices change to 80p, 100p and 120p a month later, the total price of the three items has remained unchanged at 300p. The arithmetic mean used to calculate RPI takes the closing price of each item and divides by the starting price. It then adds these together and divides by the number of items.

Step 1  Take closing price of each item and divide by the starting price to obtain "price relatives"

<table>
<thead>
<tr>
<th>Item</th>
<th>Price relatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item A</td>
<td>80÷100 =0.8</td>
</tr>
<tr>
<td>Item B</td>
<td>100÷100 = 1</td>
</tr>
<tr>
<td>Item C</td>
<td>120÷100 = 1.2</td>
</tr>
</tbody>
</table>

Step 2  Add price relatives together and divide by number of items

i.e.  (0.8 + 1 +1.2) ÷ 3 = 1

Therefore, on average the closing price is one times the starting price. This is the same as saying that on average prices have remained unchanged, which is exactly what has happened in reality in this scenario.

The geometric mean takes the closing price of each item and divides by the starting price. It then multiplies these together and finds the mathematical root.

Step 1  Take closing price of each item and divide by the starting price to obtain "price relatives"

<table>
<thead>
<tr>
<th>Item</th>
<th>Price relatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item A</td>
<td>80÷100 =0.8</td>
</tr>
<tr>
<td>Item B</td>
<td>100÷100 = 1</td>
</tr>
<tr>
<td>Item C</td>
<td>120÷100 = 1.2</td>
</tr>
</tbody>
</table>

Step 2  Multiply price relatives together

i.e. 0.8 × 1 × 1.2 = 0.96

Step 3  Find the root of this total in accordance with the number of items. In this case there are three items so it is necessary to find the cube root

i.e.  $\sqrt[3]{0.96} = 0.986$

This means that the geometric mean calculates the total closing price as 0.986 of the starting price i.e. it records a 1.4% decline, despite the fact that in reality prices have remained stable.

---

4 The figures in this example are taken from Use of the CPI for Cost of Living Adjustments, a paper by Mark Courtney, former Deputy Director and Head of Economics, Regulatory Impact Unit, Cabinet Office