This factsheet provides a short guide to inflation, how it is measured, and why and how those measures are used.
WHAT IS INFLATION?

Inflation is where the price of a single item, or set of goods and services, rises over time. Deflation is the opposite, where prices fall over time.

Measures of inflation are produced by collecting the prices of goods and services and comparing them over time. The selection of goods and services’ prices that are measured and tracked is known as the basket of goods. The changes in price are weighted and consolidated into a single index based on a typical pattern of expenditure. Different measures are used for different purposes and both the basket of goods and the weighting differs to reflect the intended use of the index.

Measures of inflation tend to be indices, with prices compared to a base year normally equalling 100. For example, the Retail Price Index’s (RPI) food index in 1989 was 110.5 and in 2012 it was 213.3. This means that the price of food has almost doubled in 23 years. Thus, in relation to food, the purchasing power of £1 has halved between 1989 and 2012.

Headline measures of inflation are usually presented in terms of annual inflation growth. Annual inflation is the typical percentage change in prices experienced over the previous twelve months.

The table on the right shows that the Consumer Price Index was 124.4 in January 2013 compared to 121.1 in January 2012. The annual inflation growth in January 2013 was 2.7%, which is the percentage increase of the index, not the increase in the value of the index itself.

It is important to note that you cannot add annual rates of inflation to find the overall inflation rate over several years. An annual 3% increase every year over ten years is not an increase of 30%, but an increase of 34%. This is because annual inflation is compounded over several years.

The annual percentage increase is most useful to show inflation being experienced over the previous twelve months; however, for comparisons over a period of more than one year, the index can be a better tool to use. There is an explanation of how to adjust prices for inflation using an index later in this factsheet.

Purpose of Inflation Indices

Erwin Diewert (2012) notes that there are three main purposes for an inflation index:

- As a summary measure of the overall rate of price change;
- As a deflator for the aggregate of the sector [or economy], so that nominal prices can be converted to constant prices; and
- As a compensation indexation measure, to uprate wages or benefit payments. (Normally only household inflation measures are used for this purpose.)
Real/Cash Terms

As noted above, measures of inflation are used to show the value of money as if it had a constant purchasing power. There are a number of terms used both to describe the value of money at the time and the value adjusted for inflation. The figure on the right lists some of the terminology you may come across.

The terms listed on the left refer to the cash value at the time, the actual pounds and pence spent in any given year. The list on the right is of terms for values presented in a single year’s purchasing power.

HOUSEHOLD INFLATION

Household inflation is the inflation experienced by the household consumers. The two indices most often quoted in the UK are the Consumer Price Index and the Retail Price Index.

Consumer Price Index (CPI)

The CPI is the UK government’s preferred measure of household inflation and is used for the Bank of England’s target of 2% annual inflation. CPI therefore influences the Bank’s decisions on bank rates which feeds through to the cost of borrowing.

The Office for National Statistics is legally obliged to produce the CPI. CPI is the UK’s version of the Harmonised Index of Consumer Prices (HICP), which is the EU’s standard measure of household inflation.

In April 2011, the UK government announced that CPI is to be used for the indexation of benefits, tax credits and public sector pensions. (Office for National Statistics 2012a)

Retail Price Index (RPI)

RPI was introduced in 1947 and was adopted as the official measure of inflation in 1956. Although CPI has been the UK Government’s preferred measure of inflation since 2003, RPI is still used for a variety of purposes, such as Index-linked government bonds, price regulation for certain utilities and rail fares, a number of private pensions and wage negotiation. (Office for National Statistics 2012a)

Differences between CPI and RPI

The Office for National Statistics (2012a) notes that the main differences between CPI and RPI are:
- The population base, RPI excludes very high and low income households;
- Commodity coverage, CPI excludes owner-occupier housing costs; and
- Different formulae are used to combine prices of groups of relatively similar goods and services which nonetheless will have a range of prices.

The chart below shows the annual rate of change of inflation for both CPI and RPI. As you would expect, there is significant correlation between the two measures, with RPI normally above CPI. However, during the period between September 2008 and April 2010, RPI dropped significantly, before resuming at a level above CPI. The fall in RPI during this period was due largely to the sharp decrease in Bank of England interest rates and the affect this had on mortgage repayments.

RPI did not return to being above CPI until around a year after the last reduction in interest rates. This illustrates two points. First that when there is a change in owner-occupier housing costs, the impact on RPI is significant, and second that any change in prices affects the annual change in inflation for 12 months after the change before it falls out of the calculation.
GDP DEFLATOR

The GDP (Gross Domestic Product) deflator is used to show inflation for all goods and services produced in the UK, including government services investment goods and exports. It excludes the price of imports.

The GDP deflator is used as a tool to show GDP in constant prices and due to its wide scope, it is suitable to deflate public expenditure. The GDP deflator is used to calculate real terms figures for both the UK and Scottish Government’s budgets. (HM Treasury, 2013).

Some care should be taken when using the GDP deflator for individual departments. For example, the inflationary pressures on the NHS will differ to those faced by the economy as a whole.

How to Use the GDP Deflator

The GDP Deflator index can be used to adjust cash values for inflation and present financial data at a particular year’s prices.

The current deflator series uses 2011/12 as the base year which is represented by 100. All the other years’ figures are, essentially, percentages of the base year. The figure for 2001/02 is 78.635, which means that a pound in 2011/12 was worth the same as 78.635p in 2001/02, using this measure of inflation.

You will note that the deflator index covers the period up to the previous financial year. To inflate for the current year, or further into the future, you would use the treasury’s forecasted percentage changes, shown in the third column, noting that the percentages are compounded.

In general, to express a value from Year A in Year B’s prices:

\[
\frac{\text{Year A Value}}{\text{Year A Index}} \times \text{Year B Index} = \text{Year A value in Year B prices}
\]

<table>
<thead>
<tr>
<th>Financial year</th>
<th>2011-12 = 100</th>
<th>% change on previous year</th>
<th>Money GDP (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>77.163</td>
<td>0.54</td>
<td>986,858</td>
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<tr>
<td>2001-02</td>
<td>78.635</td>
<td>1.91</td>
<td>1,029,350</td>
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<tr>
<td>2002-03</td>
<td>80.601</td>
<td>2.5</td>
<td>1,085,938</td>
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<tr>
<td>2003-04</td>
<td>82.38</td>
<td>2.21</td>
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<td>2004-05</td>
<td>84.812</td>
<td>2.95</td>
<td>1,214,413</td>
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<td>2005-06</td>
<td>86.751</td>
<td>2.29</td>
<td>1,284,547</td>
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<td>2006-07</td>
<td>89.082</td>
<td>2.69</td>
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<td>2007-08</td>
<td>91.302</td>
<td>2.49</td>
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<td>2008-09</td>
<td>93.793</td>
<td>2.73</td>
<td>1,422,290</td>
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<tr>
<td>2009-10</td>
<td>95.205</td>
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<td>2010-11</td>
<td>97.911</td>
<td>2.84</td>
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<td>2011-12</td>
<td>100.000</td>
<td>2.13</td>
<td>1,525,746</td>
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<td>2012-13(^1)</td>
<td>-</td>
<td>2.5</td>
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<td>2013-14(^1)</td>
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<td>2014-15(^1)</td>
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<td>1,689,000</td>
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</table>

\(^1\)For years 2012-13 to 20114-15 this presentation only shows percentage changes and money GDP forecasts, rounded to the nearest billion, in line with the 2012 Autumn Statement.

Source: (HM Treasury, 2013a)
Two related examples below illustrate how to use an index to inflate or deflate cash values:

**EXAMPLE 1 Deflating**

If you wished to represent £100m of expenditure in 2011/02 in 2001/02 prices, you would follow the following steps:

\[
\frac{£100m}{100} \times 78.635 = £78.635m
\]

£100m in 2011/12 represents £78.635m in 2001/02 prices. Or to put it another way, £100m bought the same amount of goods and services in 2011/12 as £78.635m did in 2001/02.

**EXAMPLE 2 Inflating**

If you wished to represent £100m of expenditure in 2001/02 in 2011/12 prices, the process would be very similar:

\[
\frac{£100m}{78.635} \times 100 = £127.170m
\]

£100m in 2001/02 represents £127.170m in 2011/12 prices. Or £100m bought the same amount of goods and services in 2001/02 as £127.170m did in 2001/02.

HM Treasury publishes and revises the GDP Deflator series. It can be found here: [http://www.hm-treasury.gov.uk/data_gdp_fig.htm](http://www.hm-treasury.gov.uk/data_gdp_fig.htm). HM Treasury also provides a helpful guide on how to use the deflator series here, which goes into more detail than space has allowed here: [http://www.hm-treasury.gov.uk/data_gdp_annex.htm](http://www.hm-treasury.gov.uk/data_gdp_annex.htm).

SPICe has produced an inflation tool based on HM Treasury GDP Deflator series. This can be accessed from the Financial Scrutiny webpage on the Scottish Parliament website. [http://www.scottish.parliament.uk/parliamentarybusiness/16305.aspx](http://www.scottish.parliament.uk/parliamentarybusiness/16305.aspx)

**OTHER INFLATION INDICES**

Inflation is uneven and differing sectors of the economy will face different levels of inflation. In addition to the inflation measures for the household sector and the economy as a whole that we have looked at above, there are a range of other indices, a number of which are noted below.

**Producers’ Price Index (PPI) & Service Producer Price Indices (SPPI)**

PPI measures the change in price of goods purchased and sold by manufacturers in the UK. The headline measure is known as ‘factory gate inflation’ measures the change in price of goods sold by UK manufacturers to other UK businesses. The SPPI provides similar information for the services sector (Office for National Statistics 2013b).

**House Price Index (HPI)**

The HPI measures the change in house prices in the UK, taking into account the changes in types of housing over time. Figures are available for the constituent nations of the UK and the English regions (Office for National Statistics 2013c).
Personal Inflation Calculator

Personal Inflation Calculators use the data from the household inflation indices and reweight the changes in pattern to more reflect an individual’s personal expenditure. This produces an annual rate of inflation with a more personalised weighting of the basket of goods.

  
  Some browsers do not support the ONS’ calculator. If your browser does not support the page, the BBC reproduces them every month.

SOURCES


HM Treasury (2013a), Latest Figures (Online) Available at: http://www.hm-treasury.gov.uk/data_gdp_fig.htm Accessed 5 March 2013

HM Treasury (2013b), User's guide: Overview of GDP deflator series (Online) Available at: http://www.hm-treasury.gov.uk/data_gdp_guide.htm Accessed 5 March 2013
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