

Article

Consumer Price Indices: A brief guide: 2016

A guide for users that gives an overview of consumer price inflation statistics. This briefly covers what CPI is, what it is used for and how it is calculated.

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Table of contents

1. [Consumer Price Indices](#)
2. [Inflation figures](#)
3. [The shopping basket](#)
4. [The cost of living](#)
5. [What's in the basket?](#)
6. [Price collection](#)
7. [Quality change](#)
8. [Weighting](#)
9. [Updating the shopping basket](#)
10. [Calculating the Index](#)
11. [Reference dates](#)
12. [Index dates](#)
13. [Differences between the CPI and other Consumer Price Inflation measures](#)
14. [Publication](#)
15. [Further information](#)

1 . Consumer Price Indices

Consumer Price Indices are important indicators of how the UK economy is performing.

The indices are used in many ways by the government, businesses, and society in general. They can affect interest rates, tax allowances, wages, state benefits, pensions, maintenance, contracts and many other payments. They also show the impact of inflation on family budgets. This booklet describes the main consumer price indices in the UK and explains how they are put together. It focuses on the Consumer Prices Index (CPI) but highlights areas where other measures differ significantly.

2 . Inflation figures

Consumer Price Inflation (CPI) is the speed at which the prices of the goods and services bought by households rise or fall. Consumer price inflation is estimated by using price indices. One way to understand a price index is to think of a very large shopping basket containing all the goods and services bought by households. The price index estimates changes to the total cost of this basket. Most of our price indices are published monthly.

In the UK, the main measure of inflation is the CPI. The CPI is a measure of consumer price inflation produced to international standards and in line with European regulations. First published in January 1996 as the Harmonised Index of Consumer Prices (HICP), the CPI is the inflation measure used in the government's target for inflation.

The CPI is also used for purposes such as uprating pensions, wages and benefits and can aid in the understanding of inflation on family budgets.

Other major measures of consumer price inflation include:

CPIH

A measure of UK consumer price inflation that include owner occupiers' housing costs, which are important components of household expenditure. In March 2016, the National Statistician announced the intention for CPIH to become our preferred measure of inflation.

Retail Prices Index (RPI)

A long-standing measure of UK inflation that has historically been used for a wide range of purposes such as the indexation of pensions and rents and index-linked gilts. In accordance with the Statistics and Registration Service Act 2007, the Retail Prices Index and its derivatives have been assessed against the Code of Practice for Official Statistics and found not to meet the required standard for designation as National Statistics.

RPIJ

A variant of RPI which is calculated using formulae that meet international standards.

The CPI and other indices measure a wide range of prices.

The price of cars or hi-fi equipment might fall while the price of food or petrol may rise. The indices represent the average change in prices across a wide range of consumer purchases. This is achieved by carefully recording the prices of a typical selection of products from month to month using a large sample of shops and other outlets (including the provision of goods and services via the internet) throughout the UK.

The rest of this article explains how the CPI is compiled.

The approach used for other indices is generally very similar, although some specific differences are highlighted later in this guide.

3 . The shopping basket

A convenient way of thinking about the Consumer Price Index (CPI) is to imagine a very large "shopping basket" full of goods and services on which people typically spend their money: from bread to ready-made meals, from the cost of a cinema seat to the price of a pint at the local pub, from a holiday in Spain to the cost of a bicycle. The content of the basket is fixed for a period of 12 months, however, as the prices of individual products vary, so does the total cost of the basket. The CPI, as a measure of that total cost, only measures price changes. If people spend more because they buy more goods this is not reflected in the index.

The quantities or "weight" of the various items in the basket are chosen to reflect their importance in the typical household budget.

In practice of course we all spend different amounts on various goods and services that show different price movements.

While no one is "average", it is still convenient to have summary price measures which, although they may not strictly apply to any one individual or family, will still give us a useful yardstick of the impact of inflation on our own pocket or purse.

Considerable care is taken to ensure that the shopping basket is kept up-to-date and is representative of people's spending patterns: the places and shops we go to, the goods and services that we buy and the amounts we spend on them.

4 . The cost of living

The Consumer Price Index (CPI) is not a "cost of living" index, a concept that means different things to different people. To many it would suggest the changing costs of basic essentials, but in practice it would be very difficult to agree on a definition of "essentials". The index simply indicates what we would need to spend in order to purchase the same things we bought in an earlier period, irrespective of whether particular products are "needed" or are "good for you". For example, cigarettes are included in the index as many people buy them. However, the calculations reflect the average shopping basket and so also take account of the fact that many people do not buy tobacco.

5 . What's in the basket?

The Consumer Price Index (CPI) includes all types of household spending, as shown The CPI includes all types of household spending. There are some exceptions – savings and investments, charges for credit, betting and cash gifts – that fall outside the scope of the index. Many owner-occupiers' housing costs are also currently excluded from the CPI, however since March 2013 we have published a newer measure of consumer price inflation called CPIH which includes these costs.

It is impractical and unnecessary to monitor the price of every product sold in every single shop. The prices of similar items can reasonably be assumed to move in line with one another in response to market forces. It is therefore sufficient to compile the index using prices of a large and varied sample of products in selected locations. The goods and services for which prices are recorded are called "representative items".

The CPI is compiled using around 700 separate representative items. Their movements are taken to represent the price changes for all goods and services covered by the index, including those for which prices are not specifically monitored. There are, for example, several items in the basket covering purchases of bread – such as a large white sliced loaf and large wholemeal loaf – that are combined together to estimate the overall change in bread prices.

Table 1: Consumer Prices Index - structure and 2016 weights

Divisions	Weight
CPI (overall index)	1,000
01 Food and non-alcoholic beverages	103
02 Alcoholic beverages and tobacco	42
03 Clothing and footwear	71
04 Housing, water, electricity, gas and other fuels	120
05 Furniture, household equipment and maintenance	9
06 Health	28
07 Transport	153
08 Communication	32
09 Recreation and culture	148
10 Education	25
11 Restaurants and hotels	123
12 Miscellaneous goods and services	96
All goods	517
All services	483
01.1 Food	91
01.1.1 Bread and cereals	15
01.1.2 Meat	21
01.1.3 Fish	4
01.1.4 Milk, cheese and eggs	12
01.1.5 Oils and fats	2
01.1.6 Fruit	9
01.1.7 Vegetables including potatoes and tubers	13
01.1.8 Sugar, jam, syrups, chocolate and confectionery	12
01.1.9 Food products (nec)	3
01.2 Non-alcoholic beverages	12
01.2.1 Coffee, tea and cocoa	3
01.2.2 Mineral waters, soft drinks and juices	9
02.1 Alcoholic beverages	19
02.1.1 Spirits	5
02.1.2 Wine	9
02.1.3 Beer	5
02.2 Tobacco	23
03.1 Clothing	61
03.1.2 Garments	54
03.1.3 Other clothing and clothing accessories	6
03.1.4 Cleaning, repair and hire of clothing	1

03.2 Footwear including repairs	10
04.1 Actual rentals for housing	72
04.3 Regular maintenance and repair of dwelling	2
04.3.1 Materials for maintenance and repair	1
04.3.2 Services for maintenance and repair	1
04.4 Water supply and misc. services for the dwelling	11
04.4.1 Water supply	6
04.4.3 Sewerage collection	5
04.5 Electricity, gas and other fuels	35
04.5.1 Electricity	17
04.5.2 Gas	16
04.5.3 Liquid fuels	1
04.5.4 Solid fuels	1
05.1 Furniture, furnishings and carpets	20
05.1.1 Furniture and furnishings	16
05.1.2 Carpets and other floor coverings	4
05.2 Household textiles	7
05.3 Household appliances, fitting and repairs	8
05.3.1/2 Major appliances and small electric goods	7
05.3.3 Repair of household appliances	1
05.4 Glassware, tableware and household utensils	6
05.5 Tools and equipment for house and garden	5
05.6 Goods and services for routine maintenance	13
05.6.1 Non-durable household goods	5
05.6.2 Domestic services and household services	8
06.1 Medical products, appliances and equipment	13
06.1.1 Pharmaceutical products	8
06.1.2/3 Other medical and therapeutic equipment	5
06.2 Out-patient services (Dec 1999 = 100)	7
06.2.1/3 Medical services & paramedical services (Dec 1999 = 100)	4
06.2.2 Dental services (Dec 1999 = 100)	3
06.3 Hospital services (Dec 2000 = 100)	8
07.1 Purchase of vehicles	43
07.1.1A New cars	3
07.1.1B Second-hand cars	16
07.1.2/3 Motorcycles and bicycles	2
07.2 Operation of personal transport equipment	73
07.2.1 Spare parts and accessories	5

07.2.2 Fuels and lubricants	32
07.2.3 Maintenance and repairs	22
07.2.4 Other services	14
07.3 Transport services	37
07.3.1 Passenger transport by railway	13
07.3.2 Passenger transport by road	12
07.3.3 Passenger transport by air	8
07.3.4 Passenger transport by sea and inland waterway	4
08.1 Postal services	2
08.2/3 Telephone and telefax equipment and services	30
09.1 Audio-visual equipment and related products	18
09.1.1 Reception and reproduction of sound and pictures	5
09.1.2 Photographic, cinematographic and optical equipment	2
09.1.3 Data processing equipment	7
09.1.4 Recording media	3
09.1.5 Repair of audiovisual equipment & related products	1
09.2 Other major durables for recreation & culture (Dec 1999 = 100)	12
09.2.1/2 Major durables for in/outdoor recreation (Dec 1999 = 100)	12
09.3 Other recreational items, gardens and pets	35
09.3.1 Games, toys and hobbies	20
09.3.2 Equipment for sport and open-air recreation	3
09.3.3 Gardens, plants and flowers	4
09.3.4/5 Pets, related products and services	8
09.4 Recreational and cultural services	33
09.4.1 Recreational and sporting services	10
09.4.2 Cultural services	23
09.5 Books, newspapers and stationary	14
09.5.1 Books	4
09.5.2 Newspapers and periodicals	5
09.5.3/4 Misc. printed matter, stationary, drawing materials	5
09.6 Package holidays	36
10.0 Education	25
11.1 Catering services	101
11.1.1 Restaurants & cafes	93
11.1.2 Canteens	8
11.2 Accommodation services	22
12.1 Personal care	31
12.1.1 Hairdressing and personal grooming establishments	8

12.1.2/3 Appliances and products for personal care	23
12.3 Personal effects (nec)	16
12.3.1 Jewellery, clocks and watches	9
12.3.2 Other personal effects	7
12.4 Social protection (Dec 1999 = 100)	16
12.5 Insurance	9
12.5.2 House contents insurance	2
12.5.3 Health insurance (Dec 1999 = 100)	3
12.5.4 Transport insurance	4
12.6 Financial services (nec)	12
12.6.2 Other financial services (nec)	12
12.7 Other services (nec)	12

Source: Office for National Statistics

6 . Price collection

Around the middle of each month, price collectors record about 100,000 prices for around 520 items consisting of specified types of goods and services. The price collectors are employed by the contractor (TNS) to carry out price collection on our behalf, visiting a variety of shops in around 150 locations throughout the UK. Most local shops are visited in person to collect prices at first hand, although some work is done by telephone. The price collectors go to the same shops each month, noting the prices of the same products, so that over time they compare "like with like".

The reliability of the index depends very much on retailers' goodwill. The information collected is treated with the strictest confidence, and no data relating to individual retailers or businesses is ever divulged or passed on to a third party.

For many goods and services it is more efficient to collect prices centrally (that is at ONS). Information on charges such as those for football admissions, water supply, newspapers and rail fares – about 80,000 prices for 190 items in all – are obtained from central sources and used in the CPI and other measures. Prices for some large chain stores that have national pricing policies are also collected centrally by us.

7 . Quality change

It is important that the index calculations are based on "like for like" comparisons, of prices each month for each of the items in the basket.

However, some brands or varieties of particular products priced at the start of the year may not be available in later months. This is common in markets where the rate of technological progress is high, as is the case with many electronic goods, or where consumer tastes change rapidly, for example in clothing.

When particular products do disappear from the market, care is taken to ensure that replacements are of broadly comparable quality so that price comparisons are not distorted. If this is not possible, prices are adjusted to take account of the change in quality, using one of a range of techniques, from fairly simple methods, to procedures that relate the prices of goods to their features.

Explicit adjustments are made, for example, in the case of personal computers, where most replacement models are of higher quality than their predecessors. A rise in price might be accompanied by improvements in processing speed for example. In this case, an index which did not take account of improved quality would show higher inflation than an index that does adjust for quality change.

A simpler example occurs where a manufacturer changes the size or weight of a product. For example, this has happened with the size of some confectionery products being reduced. Not adjusting for this change would result in an index showing lower inflation than an index that is adjusted for the change.

In this way, quality adjustment helps to focus the index on "underlying" price changes for a fixed basket of goods and services.

8 . Weighting

We spend more on some things than others, so we would expect, for example, a ten per cent increase in the price of petrol to have a much bigger impact on the Consumer Price Index (CPI) than a similar rise in the price of tea. For this reason, the components of the index are "weighted" to ensure that it reflects the importance of the various items in the average shopping basket, and the amounts we spend in different regions of the country and in different types of shops.

The CPI and CPIH's weights are based on the monetary expenditure of all private households in the UK, foreign visitors to the UK and residents of communal establishments such as nursing homes, retirement homes and university halls of residence. The weights are mainly derived from the Household Final Monetary Consumption Expenditure component of the national accounts.

The weights for the Retail Price Index (RPI) and RPIJ are derived from a number of sources but mainly from our Living Costs and Food Survey. Each year, a sample of several thousand households from all over the country keep records of their spending over the course of a fortnight. They also record details of major purchases over a longer period.

In calculating the weights for the RPI and RPIJ, the expenditure of certain private households are excluded. Households whose income is within the top 4 per cent of all households and pensioner households which derive at least three quarters of their total income from state pensions and benefits are excluded on the grounds that the spending of these groups are significantly different from the majority. These restrictions are designed to make the RPI and RPIJ more representative of the "typical household". Pensioners who are mainly dependent on state benefits are represented in separate "pensioner indices".

In addition, the RPI and RPIJ also exclude residents of communal establishments and foreign visitors to the UK.

9 . Updating the shopping basket

It is important that the index is representative and kept up-to-date. The basket of goods and services is therefore reviewed every year, helping to ensure that the Consumer Price Index (CPI) calculations more accurately reflect UK shopping and purchasing patterns.

A wide range of information is used in determining the contents of the CPI basket, including our own surveys of household spending, external market research and feedback from the price collectors. Some changes to the basket are necessary each year due to changing markets, fashions and new products. Smart phones and tablet PCs for example, have been added in recent years. The basket is fixed for a period of 12 months.

The weights for the index are also changed each year to keep pace with general changes in our spending habits. Over the years people have tended to spend more of their money on electrical goods, travel and leisure while the proportion they spend on basics has fallen.

10 . Calculating the Index

After the price data have been checked and processed, the resulting price indicators are combined. Changes in prices of the individual goods and services in the index are measured by comparing them to their levels in the previous January. These are then weighted together using the weights for the current year to produce an overall average price change.

The final stage in the calculation is to link the average price changes with the figures for earlier years. Only by "chain-linking" the calculations in this way can the index:

- take account of changes in the make-up of the shopping basket from year to year
- provide "like for like" comparisons between different years

This procedure ensures that the index is not distorted when items are either removed from, or introduced into the Consumer Price Index (CPI) "shopping basket".

11 . Reference dates

The Consumer Price Index (CPI) measures price changes, not price levels. It is therefore expressed in terms of the comparison of prices relative to 2015, when the index is given a value of 100.

For example:

The annual rate of inflation is simply the percentage change in the latest index compared to the value recorded twelve months previously.

The CPI reference date of 2015 is arbitrary, providing simply a convenient benchmark for comparison. The choice of date has no material effect on the measurement of price changes between one month and another. The official series started in January 1996, although estimates are available back to 1988. CPIH is also expressed in terms of the comparison of prices relative to 2015. The official series for CPIH starts in 2005.

Compared with the CPI, the Retail Price Index (RPI) has a much longer history. The series started in 1947, and prices are expressed relative to January 1987, when the index has a value of 100. RPIJ is expressed on the same basis as the RPI, though data are only available from 1997 onwards.

12 . Index dates

The index always refers to the second or third Tuesday of each month. Since it can often take longer than one day to collect all the local shop prices, some of these are collected on the Monday or the Wednesday. However, certain prices, which can fluctuate markedly from day to day, always relate to the Tuesday. Centrally collected prices, with only a few exceptions, also relate to a Tuesday.

The Consumer Price Index (CPI) and other consumer price indices share the same price collection dates, with the exception of prices for petrol and diesel. For the CPI and CPIH, prices are averaged over the month, based on the prices prevailing on each Monday during the month. This approach is adopted in order to comply with EU Regulations.

13 . Differences between the CPI and other Consumer Price Inflation measures

The Consumer Price Index (CPI) uses essentially the same basic price data as the other consumer price inflation measures but differs from them in some important respects.

The differences include:

Population base

The CPI and CPIH covers a broader population than the RPI and RPIJ

Item coverage

Currently the coverage of CPI and CPIH is identical, except for the inclusion of a measure of owner-occupiers' housing costs in the latter. The RPI and RPIJ include a number of items relating to housing costs (such as mortgage interest payments and council tax) that are not included in the CPI. Conversely there are also some services covered by the CPI and CPIH – such as charges for financial services – which are not in the RPI or RPIJ.

Index methodology – formula

The CPI and CPIH mostly use the geometric mean (with some use of the arithmetic mean) whereas the RPI uses the arithmetic mean to combine prices at the first stage of aggregation. The RPIJ uses the same formula as the RPI with the exception of one form of the arithmetic mean (known as the Carli) who's use has been replaced by the geometric mean.

item coding

The CPI and CPIH structure follows a standard international classification system whereas the RPI and RPIJ have their own unique system.

14 . Publication

The figures are published each month on our [website](#), in a Statistical Bulletin with accompanying detailed briefing notes, on a Tuesday about a month after the index date. The publication dates are announced at least six months in advance.

The latest headline figures can be obtained by contacting the recorded information service on: +44 (0)800 0113703

Data are also available on the Time Series Data pages on our website.

A detailed explanation of the methodology used in compiling the indices is given in the Consumer Price Indices Technical Manual, which can be found by using the search engine on our [website](#).

15 . Further information

Further information about the Consumer Prices Index, CPIH, the Retail Prices Index and RPIJ can be obtained from:

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