

## FEATURE

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# Inflation – experience and perceptions

## SUMMARY

Individuals sometimes comment that their personal inflation rates are different from the official rates published by the Office for National Statistics. This article explores why this might be. It starts by explaining what the retail prices index (RPI) is and how it is constructed. It then examines how individuals' personal experiences of inflation might vary according to their spending patterns. Finally, the article looks at how perceptions of inflation rates might vary by how frequently goods and services are bought.

ONS does not directly measure the public's perceptions of inflation, but it is clear from correspondence received and reports in the media that many people think that inflation is higher than that shown by the official figures and that this has gone some way in undermining confidence in them. Indeed, a survey commissioned in March 2005 by the Office for National Statistics (ONS) found that the inflation figures were among the less trusted official statistics, ranking fourth out of six key statistics (Goddard).

Part of the explanation for the lack of confidence in the official inflation figures – whether based on the RPI or consumer prices index (CPI) – is that they represent the expenditure and inflation experiences of an average household and that, not surprisingly, most people's expenditure patterns, and their resulting experience of price changes, will differ from that average. In addition, a person's perceptions of their personal inflation rates can be affected by how often they buy specific goods and services.

One possible source of confusion is between lower inflation and lower prices. Inflation is the rate of increase in prices. A fall in the inflation rate from 3 per cent to 2 per cent, for example, is described as a fall in, or lower, inflation. It does not mean, as some people might believe, that prices have fallen in an absolute sense, but that prices generally are not increasing as much. The prices of some individual goods and services have fallen, some clothes prices

being a recent example, but generally prices in the UK tend to rise and inflation, the increase in the general level of prices, has been positive.

This article investigates some of the reasons why inflation rates will vary in practice between households and goes on to show that the most frequently bought goods and services, which might most heavily influence perceptions of inflation, have in recent years generally risen at a faster rate than prices overall.

Interest in perceptions of inflation is not confined to the UK. It has also been considered in the European context by, among others, the European Central Bank (2006) and D'Elia (2005) in Italy.

The analysis in the current article focuses on the RPI, the long-standing and familiar domestic measure of inflation, whose uses include indexation of pension payments, state benefits and private contracts. It covers the full range of consumers' expenditure, including council tax and owner-occupiers' housing costs, but excludes some pensioner households and high-income households. The conclusions reached apply equally to the CPI. This is a macro-economic measure of inflation that is used for the Government's inflation target and has been developed according to international guidelines. The CPI is calculated from the same basic data as the RPI but its methodology and coverage differ in a number of important respects. It excludes most owner-occupier housing costs (see Roe and Fenwick (2003) for more details).

## Background to the retail prices index

The RPI covers the full range of goods and services bought by the vast majority of households. This includes the essentials, such as food, housing and heating, as well as discretionary purchases, such as audio-visual equipment and holidays. It covers daily purchases, such as newspapers, as well as very infrequent purchases such as cars and washing machines. The RPI measures the changing price, on a month-by-month basis, of a 'representative basket' of about 650 goods and services – the exact number varies from year to year. **Box 1** explains how prices are collected and the care that is taken to gather together a representative sample of prices.

Because we spend more on some items than others, we would expect a 10 per cent increase in the price of petrol, say, to have a much bigger impact on the RPI than, say, a 10 per cent 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 as measured by the total expenditure on them when averaged across all relevant households, and the amount spent in different regions of the country and in different types of shops. **Box 2** explains in more detail how the expenditure weights for the RPI shopping basket are obtained and used to calculate inflation rates.

It is important that the index calculations are based each month on 'like for like' comparisons of prices 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

### Box 1

#### Price collection

Around the middle of each month, price collectors record about 110,000 prices for over 550 items consisting of specified types of goods and services. They go to a variety of shops in around 150 places throughout the UK. Prices are collected from around 25,000 shops in total. The number of price quotes collected per item in each location ranges between one (for example, bread) and six (for example, property rents); the precise number depends on the relative expenditure on each item and the variability of the prices collected. 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.

For many goods and services, particularly those where the same price is charged throughout the country, it is more efficient to collect prices centrally. Information on charges such as those for TV licences, water supply, newspapers, council tax and rail fares

– about 110 indicators in all – are obtained from central sources. Also, some large chain stores that have national pricing policies for their branches help by sending information directly to ONS. In total, around 10,000 prices are collected centrally each month.

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 RPI calculations properly reflect UK shopping and purchasing patterns.

A wide range of information is used in determining the contents of the RPI basket, including ONS's 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. Internet book purchases and DVD players, for example, have been added in recent years. The basket is held fixed for a year at a time. See Knipe (2006) for more details.

### Box 2

#### The RPI shopping basket: expenditure weights

The prices of individual items are grouped together in what are known as 'sections', such as bread or furniture. There are 85 published sections and, within these sections, around 650 detailed items. These components are combined together to produce the overall index for the RPI by weighting them to ensure that they reflect the importance, in terms of expenditure, of the various items in the average shopping basket. Within items, weights may also be calculated to take account of the amounts we spend in different regions of the country and in different types of shops.

The weights for the RPI are derived from a number of sources but mainly from ONS's Expenditure and Food Survey. Each year, a sample of over 6,000 households from all over the country keeps records of their spending over the course of a fortnight. They also record details of major purchases over a longer period.

In calculating the RPI weights, the expenditure of people in households with the top 4 per cent of incomes and low-income pensioners is excluded on the grounds that the spending of these groups is significantly different from the great majority. These restrictions are designed to make the RPI more representative of the 'typical household'. The spending patterns of the excluded pensioner households, who in 2004–05 made up around 5 per cent of all households, are fairly homogeneous (unlike the wealthy households) and separate indices are calculated and published quarterly for them.

The weights for the RPI 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 such as food has fallen.

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, say, in memory or processing speed. In this case, the quality-adjusted or 'like for like' comparison of prices will show lower inflation than an index which did not take account of improved quality. In this way, quality adjustment helps to focus the index on underlying price changes for a fixed basket of goods and services.

### Why people may experience inflation which differs from the average

An individual's personal inflation rate is more than likely to differ from the average, because we all spend different amounts of money on different goods and services whose prices may move in different ways. Indeed, it would be unusual to find somebody who precisely reflected the average, despite the strenuous efforts taken to ensure that the RPI is representative of average expenditure. The main reasons for this are:

- the RPI covers some expenditure which will only be relevant to a minority of households, although included in the basket of goods priced to ensure that it is representative of household expenditure overall. An obvious example is expenditure on tobacco, even though only about a quarter of adults are smokers. Such expenditure is obviously irrelevant for a non-smoker's inflation rate
- at a more detailed level, consumption and expenditure patterns for a particular good or service will vary between consumers. For instance, the expenditure weight associated with a smoker's consumption of tobacco may differ from the average, depending on whether they are occasional or heavy smokers
- price changes experienced by consumers will vary according to where they shop. In compiling the RPI, retail outlets are selected to be representative of household expenditure across the UK as a whole. This means, for instance, that prices collected from the major supermarkets are represented in line with their market

share. However, the retail outlets in which a particular individual shops will be specific to that individual and may differ from the average

- price changes experienced by consumers will vary according to the precise products or brands that they buy. The range of products whose prices are tracked for a particular item, such as a white sliced loaf of bread, broadly reflects the pattern of expenditure on that item and will include some own-brand products as well as branded products. If an individual buys only branded products, say, this may contribute to their personal inflation rate differing from the average. A particularly important example of this is council tax: the percentage change used in the RPI is an average across all councils, but the actual price change experienced by an individual will depend on where they live
- finally, the 650 or so items in total that make up the basket of goods and services which are priced for the computation of the RPI is a sample of all those available, as it is clearly impracticable to monitor the price of every product sold in every shop. It is assumed that the prices of similar items move in line with one another in response to market forces. For instance, changes in the price of bacon are represented by back bacon and gammon; it is assumed that other cuts of bacon will, on average, move in line with these two items. In practice, it is possible that the price movements for the particular items bought by a particular individual rather than by the population as a whole are not adequately represented in the index

### Why perceptions of inflation may differ from actual inflation experienced: inflation rates by frequency of purchase

Regardless of whether an individual's personal inflation rate differs from the average, the evidence suggests that perceptions of inflation can be heavily influenced by changes in the prices of those goods and services that are bought most frequently.

In particular, people may not notice or give sufficient weight to changes in the cost of infrequently bought items, such as household appliances (for example, cookers), and audio-visual equipment (for example, digital cameras, televisions).

These items are being bought every week in the shops and although not necessarily bought by any one individual at a given point in time, it is important to measure their price change continuously so that they are represented in the overall inflation rate. But a change in price is irrelevant to the individual until they make a repeat purchase of a particular product. Thus there are two factors at work which will influence perceptions:

- from the point of view of the individual, infrequently bought items do not form part of a typical monthly, or perhaps even annual, shopping basket
- even if they are included, an individual may find it difficult to judge how prices have changed because of the passage of time since they were last bought and how technology has advanced, so that it is only possible to find a product of better quality. An example of this is personal computers

In reality, the evidence indicates that these infrequently bought items have typically shown lower than average price increases, or in some cases price falls, in the recent past.

In order to illustrate the possible effects of frequency of purchase on perceptions of inflation, ONS has undertaken a special exercise where each category of expenditure was classified by the frequency of purchase of the associated goods or services. It was not possible to do this from survey data, such as the Expenditure and Food Survey, because they are not designed to provide this information. Instead, the classification was based on the judgement of an expert team of price analysts.

A four-way classification of frequency of purchase was used, as follows:

- at least monthly
- at least quarterly but less frequently than monthly
- at least annually but less frequently than quarterly
- less frequently than annually

The composition of these four categories is summarised in **Table 1**, with the full detail being given in the Annex.

Corresponding price indices were then compiled according to the cumulative frequency of purchase as follows:

- at least monthly
- at least quarterly
- at least annually
- all purchases (the all items RPI)

**Table 1**  
**RPI goods and services classified by frequency of purchase**

At least monthly	Food Catering Alcoholic drinks Tobacco Most housing costs Fuel and light Household consumables Pet care	Chemists' goods Most household services Motoring running costs Bus and rail fares Books and newspapers TV licences and rentals Entertainment and recreation
At least quarterly but less frequently than monthly	Clothing Discs and tapes Toys, photo and sports goods	Gardening Personal services
At least annually but less frequently than quarterly	DIY goods Footwear Vehicle maintenance Holidays	Fees and subscriptions Personal articles Air fares and other travel costs
Less frequently than annually	Consumer durables Motor vehicle purchase costs	Housing repairs

Two caveats apply when analysing the results:

- there is inevitably a degree of judgement in deciding where some categories of expenditure should be classified, particularly for those containing a mixture of products with different frequencies of purchase. For example, personal articles include monthly purchases, such as daily disposable contact lenses, but also many more articles bought much less frequently, such as jewellery and spectacle frames. The latter category accounts for the majority of the weight, so this section is categorised as 'at least annually', and
- underlying the analysis is the assumption that perceptions of inflation are based on the frequency by which goods and services are paid for rather than when they are billed. Thus, regular bills that change annually, such as council tax and water rates, are treated as monthly purchases, reflecting the fact that it is common for these bills to be paid in instalments and that they are expenses that accrue continuously. Similarly, gas and electricity bills are also treated as monthly, reflecting the fact that they are generally paid monthly. Clearly, this approach to the categorisation may not always be appropriate, as it will critically depend on an individual's perceptions, which will be influenced among other things by frequency and method of payment

The results over the last ten years are illustrated in **Figure 1**, with the most recent data, back to January 2003, shown in **Table 2**.

The table and figure indicate that the most frequently bought goods and services according to the classification described above have generally had a higher inflation rate than the published RPI in recent years. In many periods, including that from January 2003, the difference between the two exceeds 1 percentage point. In November 2004, the difference reached 2.2 percentage points, around two thirds higher than the all items rate.

A noticeable exception, when there was little difference between the two, is the period July 2001 to February 2002, when mortgage interest payments and petrol and oil prices were falling. These components are both classified as 'at least monthly purchases' and have a relatively higher weight in that index than in the 'all purchases' index. They therefore pull down the 'at least monthly purchases' inflation rate by more than the 'all purchases' rate, eliminating the gap between the two series.

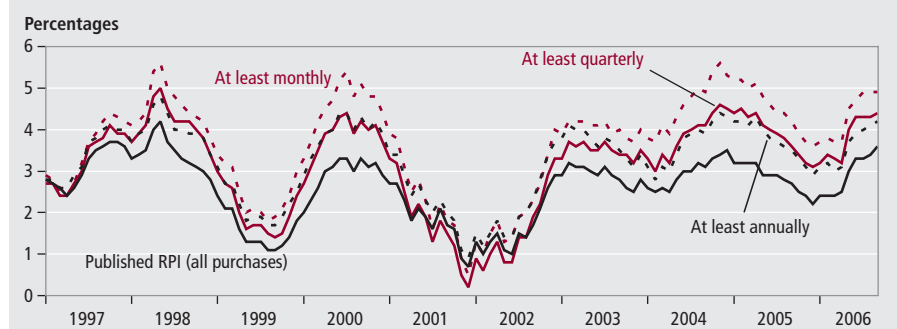
Table 2 also shows a sharp increase between April and July 2006 in the inflation rates. This is driven in large part by a sharp increase in electricity and gas prices, whose

annual inflation rates increased from 17 to 26 per cent and 25 to 36 per cent respectively. Energy costs make up a greater proportion of the 'at least monthly purchases' index than they do in the 'all purchases' index, thus contributing to a widening of the gap between these two indices over this period.

The figure also shows that the 'at least quarterly' and 'at least annually' series generally lie between the 'at least monthly' and 'all purchases' series. The reasons for this can be seen by looking at Table 1 and the Annex. In 2006, two thirds of the RPI basket was classified as being 'at least monthly' purchases, of which a substantial element is services, whose costs have recently tended to rise at a faster rate than the all items RPI, reflecting in part movements in wage costs. The 'at least annually but less frequently than quarterly' purchases category also includes a substantial element of services. In contrast, the majority of expenditure covered by the 'at least quarterly but less frequently than monthly' and 'less frequently than annually' categories are goods. In particular, these two categories cover clothing and consumer durables respectively, prices for both of which have been falling since 1998.

It is also worth noting that the items included in the monthly purchases index tend to be those that might be regarded as necessities. These are items that households have to buy, such as food, heating and housing, regardless of how prices are moving. In times when these costs are rising faster than the average, the proportion of expenditure by households on necessities will tend to increase, while relatively less will be spent on optional infrequent purchases, such as durable goods, where prices are falling. In these circumstances, in the short term, an individual's inflation rate may tend to move closer to the monthly purchases index than the all items index, reflecting changes in expenditure. This phenomenon, which is commonly referred to as the substitution effect, by convention

**Figure 1**  
**RPI percentage change over 12 months by frequency of purchase**



**Table 2**  
**RPI inflation rates analysed by frequency of purchase**

		Percentage change over 12 months				
		At least monthly	At least quarterly	At least annually	All purchases	Difference between monthly and all purchases
2003	Jan	3.9	3.3	3.6	2.9	1.0
	Feb	4.2	3.7	4.0	3.2	1.0
	Mar	4.2	3.6	3.9	3.1	1.1
	Apr	4.2	3.7	3.9	3.1	1.1
	May	4.1	3.5	3.7	3.0	1.1
	Jun	4.1	3.5	3.7	2.9	1.2
	Jul	4.2	3.7	3.8	3.1	1.1
	Aug	3.9	3.5	3.6	2.9	1.0
	Sep	4.0	3.4	3.5	2.8	1.2
	Oct	3.8	3.4	3.3	2.6	1.2
	Nov	3.7	3.2	3.1	2.5	1.2
	Dec	4.0	3.5	3.3	2.8	1.2
2004	Jan	3.8	3.3	3.1	2.6	1.2
	Feb	3.7	3.0	2.8	2.5	1.2
	Mar	4.1	3.4	3.1	2.6	1.5
	Apr	3.9	3.2	3.0	2.5	1.4
	May	4.3	3.6	3.4	2.8	1.5
	Jun	4.6	3.9	3.7	3.0	1.6
	Jul	4.8	4.0	3.8	3.0	1.8
	Aug	5.0	4.1	4.0	3.2	1.8
	Sep	4.9	4.1	3.8	3.1	1.8
	Oct	5.4	4.4	4.2	3.3	2.1
	Nov	5.6	4.6	4.4	3.4	2.2
	Dec	5.3	4.5	4.4	3.5	1.8
2005	Jan	5.2	4.4	4.2	3.2	2.0
	Feb	5.2	4.5	4.3	3.2	2.0
	Mar	5.0	4.3	4.1	3.2	1.8
	Apr	5.1	4.4	4.2	3.2	1.9
	May	4.8	4.1	4.0	2.9	1.9
	Jun	4.6	4.0	3.9	2.9	1.7
	Jul	4.4	3.9	3.6	2.9	1.5
	Aug	4.4	3.8	3.6	2.8	1.6
	Sep	4.2	3.6	3.4	2.7	1.5
	Oct	3.9	3.4	3.2	2.5	1.4
	Nov	3.7	3.2	3.0	2.4	1.3
	Dec	3.6	3.1	2.8	2.2	1.4
2006	Jan	3.7	3.2	3.0	2.4	1.3
	Feb	3.8	3.4	3.1	2.4	1.4
	Mar	3.7	3.3	3.0	2.4	1.3
	Apr	3.7	3.2	3.1	2.5	1.2
	May	4.5	4.0	3.7	3.0	1.5
	Jun	4.7	4.3	3.9	3.3	1.4
	Jul	4.9	4.3	4.0	3.3	1.6
	Aug	4.9	4.3	4.1	3.4	1.5
	Sep	4.9	4.4	4.2	3.6	1.3

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is not taken into account in price indices, such as the RPI, which is designed to measure the impact on inflation solely of price changes.

To conclude, regular monthly purchases, which account for the majority of household expenditure, have consistently run at a higher inflation rate than all purchases covered by the RPI. This may

help to explain why some individuals think that they have experienced higher inflation than they really have, and why their perceptions of the official inflation figures are inaccurate.

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## Annex

## RPI sections classified by frequency of purchase

	Frequency of purchase			Less than annually	Good(G)/service(S)/housing(H)	Weight 2006 (parts per thousand)	Sept 2006 percentage change over 12 months
	At least monthly	At least quarterly but less than monthly	At least annually but less than quarterly				
<b>Food</b>							
Bread	X				G	4	4.9
Cereals	X				G	3	0.0
Biscuits and cakes	X				G	6	2.4
Beef	X				G	4	9.2
Home-killed lamb	X				G	1	5.5
Imported lamb	X				G	1	-0.9
Pork	X				G	1	3.4
Bacon	X				G	2	6.5
Poultry	X				G	4	-2.0
Other meat	X				G	7	3.4
Fresh fish	X				G	2	10.9
Processed fish	X				G	2	6.8
Butter	X				G	1	1.2
Oil and fats	X				G	1	10.0
Cheese	X				G	3	1.1
Eggs	X				G	1	4.4
Milk	X				G	5	1.5
Milk products	X				G	4	1.9
Tea	X				G	1	11.8
Soft drinks	X				G	10	4.2
Sugar and preserves	X				G	1	2.4
Sweets and chocs	X				G	10	4.1
Unprocessed potatoes	X				G	1	10.3
Potato products	X				G	3	4.0
Other fresh vegetables	X				G	6	11.0
Processed vegetables	X				G	2	9.1
Fresh fruit	X				G	6	4.9
Processed fruit	X				G	1	1.8
Other foods	X				G	11	1.7
Coffee, etc.	X				G	1	7.5
<b>Catering</b>							
Restaurant meals	X				S	27	2.2
Canteen meals	X				S	4	2.8
Take-aways and snacks	X				S	19	3.1
<b>Alcoholic drinks</b>							
Beer on-sales	X				G	31	3.4
Beer off-sales	X				G	5	1.1
Wine and spirits on-sales	X				G	17	3.2
Wine and spirits off-sales	X				G	14	1.0
<b>Tobacco</b>							
Cigarettes	X				G	26	4.8
Tobacco and cigars	X				G	3	4.5
<b>Housing</b>							
Rent	X				S	45	2.9
Mortgage interest payments	X				H	50	13.1
Council tax	X				H	39	4.7
Water charges	X				S	12	5.5
Repairs				X	S	12	4.7
DIY materials			X		G	13	2.5
Dwelling insurance and ground rent	X				S	7	2.5
House depreciation	X				H	44	6.6

## Annex (continued)

## RPI sections classified by frequency of purchase

	Frequency of purchase				Good(G)/ service(S)/ housing(H)	Weight 2006 (parts per thousand)	Sept 2006 percentage change over 12 months
	At least monthly	At least quarterly but less than monthly	At least annually but less than quarterly	Less than annually			
<b>Fuel and light</b>							
Coal and solid fuels	X				G	1	7.9
Electricity	X				S	15	27.3
Gas	X				S	14	41.5
Oil and other fuels	X				G	3	-8.4
<b>Household goods</b>							
Furniture				X	G	26	2.6
Furnishings				X	G	11	0.6
Electrical appliances				X	G	8	-3.6
Other household equipment				X	G	5	-0.2
Household consumables	X				G	14	2.0
Pet care	X				G	7	3.6
<b>Household services</b>							
Domestic services	X				S	12	5.6
Fees and subscriptions			X		S	29	9.7
Postage	X				S	1	13.1
Telephones, etc.	X				S	24	0.2
<b>Clothing and footwear</b>							
Men's outerwear		X			G	10	-0.4
Women's outerwear		X			G	17	-0.8
Children's outerwear		X			G	6	1.0
Other clothing		X			G	7	0.0
Footwear			X		G	9	-0.5
<b>Personal goods and services</b>							
Personal articles			X		G	12	3.6
Chemists' goods	X				G	16	1.4
Personal services		X			S	13	4.7
<b>Motoring expenditure</b>							
Purchase of motor vehicles				X	G	56	-1.9
Maintenance of motor vehicles			X		S	20	5.9
Petrol and oil	X				G	40	-7.6
Vehicle tax and insurance	X				S	24	1.3
<b>Fares and other travel</b>							
Rail transport fares	X				S	5	3.1
Bus and coach fares	X				S	4	-0.3
Other travel costs			X		S	10	-1.7
<b>Leisure goods</b>							
Audio visual equipment				X	G	9	-10.6
Discs and tapes		X			G	4	-2.5
Toys, photo and sports goods		X			G	12	-4.4
Books and newspapers	X				G	10	6.4
Gardening		X			G	6	0.1
<b>Leisure services</b>							
TV Licence and rentals	X				S	12	2.5
Entertainment and recreation	X				S	17	6.1
Foreign holidays			X		S	30	1.0
UK holidays			X		S	8	4.5
<b>Weight (parts per thousand)</b>	<b>667</b>	<b>75</b>	<b>131</b>	<b>127</b>	<b>S</b>	<b>1,000</b>	