The Measurement of Inflation

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Research Centre

Focus Report

'Inflation' is the measure of the rate of change of prices, usually over a one year period. It is commonly measured using a price index based on a 'shopping basket' of the goods and services that consumers could choose to buy. Each item in the basket is selected for its ability to reflect price movements in a broad range of similar items and is given a weight according to its relative importance in overall consumer expenditure. Items are added or dropped, usually on an annual basis, to keep the index up to date with current spending patterns.

Retail Prices Index

The most widely quoted inflation index in the UK has been the Retail Prices Index (RPI) which was first published in the form we recognise today in 1956. The RPI is composed of 650 types of goods and services and measures price movements in these in 150 locations across the UK. This amounts to 120,000 separate price quotations each month. The weightings given to each item are based on the findings of the annual Family Spending Survey compiled by the Office of National Statistics.

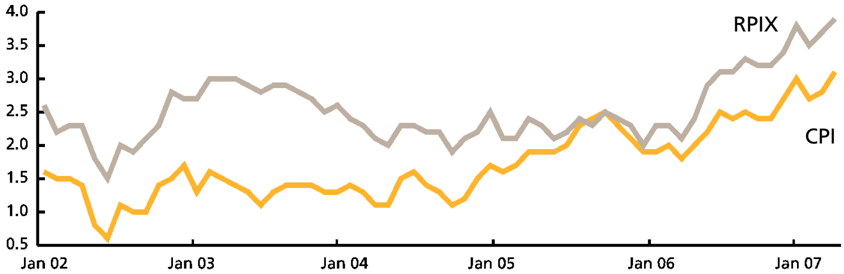
Mortgage interest payments were first introduced into the RPI in 1975, but this caused some difficulties for users of the index, as interest rate decisions began to have an impact on the measurement of inflation. For this reason, a new measure of inflation was introduced, RPIX, which excludes mortgage interest payments and thereby focuses on price changes for goods and services.

The UK first adopted an inflation target for monetary policy in 1992. When the Bank of England was granted independence in 1998, the Monetary Policy Committee was given responsibility for maintaining price stability, defined as RPIX inflation of 2.5%. Inflation was to be maintained within 1% of this figure, above or below.

Consumer Prices Index

In December 2003, the Chancellor announced that inflation would henceforth be measured using the Consumer Prices Index (CPI), which is equivalent to the Harmonised Index of Consumer Prices (HICP) used throughout Europe. The CPI was first officially published in the UK in February 1997, but was estimated all the way back to 1975 to allow comparisons to be made with RPIX. The Chancellor also announced a new inflation target of 2.0%, with an acceptable range of 1% either side of that figure.

UK RPIX and CPI



Contact

Shona Dobbie
Head of Research Centre

Alliance Trust PLC, Meadow House,
64 Reform Street, Dundee DD1 1TJ

Tel +44 (0)1382 201700
Fax +44 (0)1382 225133
Email contact@alliancetrust.co.uk
Web www.alliancetrust.co.uk

Key Differences

House Prices

The biggest difference between RPIX and CPI concerns the treatment of housing costs. RPIX includes several categories of housing related spending for owner occupiers, such as housing depreciation, which is estimated by house price moves, as well as council taxes and building insurance. These categories are currently omitted from the CPI measure of inflation.

If house price growth is high, this could cause a significant divergence between RPIX and CPI, as illustrated in the chart overleaf. This divergence will reduce the closer house price growth gets to zero. The CPI measure of inflation could even exceed the RPIX measure, should house price growth turn negative.

Household Coverage

RPIX attempts to measure average expenditure and excludes that of the very highest and lowest earners. The CPI covers expenditure by private households, foreign visitors and institutional households.

Index Composition

The CPI includes several categories of expenditure which are excluded from the RPIX measure of inflation, such as university accommodation fees, foreign students' university tuition fees and unit trust and stockbroker charges. The RPIX includes some categories of expenditure which are not in the CPI, such as vehicle excise duties and trade union subscriptions.

Weightings

Weights in the RPIX index of inflation are determined by reference to the annual Family Expenditure Survey. In the case of the CPI, weights are allocated according to the internationally agreed 'classification of individual consumption by purpose' which has the advantage of allowing comparisons to be made across different countries.

Adjustment for Quality Change

For products such as computers, where specifications change quickly, the CPI adjusts for quality change using 'hedonic regression', which relates the price of an item to its measurable characteristics. The RPIX measure of inflation employs the 'option cost' method, which estimates 50% of the retail cost of optional add-ons to the product in question. In the case of car prices, RPIX adjusts for quality change by using movements in second hand car prices to calculate price changes in new cars. The CPI index estimates changes in new car prices using a quality adjusted index based on published new prices. The two methods arrive at the same result if trends in the new car and second hand markets move in line with each other.

Differences in the Formulae Used

In the box below we show the calculation methods used to calculate the price of a good in the RPIX index of inflation, which uses a simple arithmetic formula, and the CPI, which uses a geometric average. Since a geometric average can never exceed an arithmetic average, the CPI measure of price will always be lower than RPIX. The estimated difference between the two measures of inflation, resulting from this 'formula effect', is 0.5%. As a consequence, the previous RPIX inflation target of 2.5% is roughly equivalent to the prevailing CPI inflation target of 2.0%.

If a good costs £1.99 in one location, but £2.05 and £2.19 elsewhere, the arithmetic average as used by the RPI is

(£1.99 + £2.05 + £2.19) ÷ 3 = £2.08

The geometric average, as used by the CPI is

3√(£1.99 x £2.05 x £2.19) = £2.07

only if the goods cost the same in different locations will the arithmetic and geometric averages be the same.

Similarities between RPIX and CPI

Both RPIX and CPI are 'price indices' rather than 'cost of living' indices, as they use a fixed basket of goods and services and do not allow for consumers making frequent short-term substitutions between goods as relative prices change. This means that while both RPIX and CPI can be accurate in terms of tracking price changes, they will both consistently overestimate the true cost of living. However, the impact of this is minimised by making annual revisions to the individual weights applied to each item in the construction of the index.

How Times Change

Originally, the weights applied to the constituents in the first Retail Prices Index were on the basis of what households 'should' spend their money on, rather than the actual spending. Beer was excluded and the weighting given to tobacco greatly underestimated consumption. Candles and lamps still appeared in the index in the 1930s – but not electricity. Going to a restaurant for dinner was not recognised until 1968 (and it was called 'catering') and foreign holidays were only introduced in 1993, a year before UK holidays got into the index. In 2007, Brussels sprouts have been removed from the index for the first time in 50 years, along with vegetable oil, VHS video cassettes and compact cameras. Olive oil, courgettes, satellite navigation systems and mobile downloads, such as ringtones, have been added.

RPIX v CPI as Policy Tools

Overall, there appears to be little to choose between RPIX and CPI in terms of their usefulness as a policy tool. RPIX may have the advantage of a long history as a credible macro-economic indicator, but the more recent creation of the CPI makes it more consistent with other economic variables and allows international comparisons to be made.

An inflation target must be both credible and widely accepted. However, the choice of the index employed is not as important as the need for policy makers to have a stable target that is well communicated to all concerned and that can thereby influence inflation expectations.

Source : Office of National Statistics.