

## **THE HARMONISED INDEX OF CONSUMER PRICES (HICP) : SOME FACTUAL INFORMATION**

1. The European Central Bank (ECB) has recently announced that it will use the HICP as the price measure for assessing its price stability objective<sup>1</sup>. Even though the UK is not joining EMU in 1999, it is important to pay close attention to European price movements and the actions of the ECB. The UK has strong trade links with the EMU countries and there are close interactions between the UK financial markets and those in the rest of Europe. The HICP is useful because it is the most comparable measure of consumer price inflation across the EU.

2. The Office for National Statistics (ONS) has recently constructed an extended back-run of data for the UK HICP. This paper focuses on the comparison between the HICP and the Retail Prices Index excluding mortgage interest payments (RPIX) measures of inflation.

### **What is the HICP?**

3. Harmonised Indices of Consumer Prices (HICPs) for each EU member state have been developed by the statistical offices of the member states, in conjunction with Eurostat.

The UK HICP does not replace other price indices such as the Retail Prices Index (RPI). The construction of the HICPs was intended to facilitate inflation comparisons between EU countries. They were used to check whether member states passed one of the convergence criteria for EMU membership.

The HICPs are still under development. Agreement has yet to be reached in a number of areas where methodologies for the construction of national consumer price indices differ between countries, e.g. owner occupier housing costs. Such

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<sup>1</sup> The British Government's inflation target is expressed in terms of the Retail Prices Index excluding mortgage interest payments (RPIX). Currently, the inflation target is 2½ per cent.

areas are generally excluded from HICP coverage.

To date, publication of the UK HICP has lagged that of the RPI and RPIX . But, starting with figures for January 1999 to be released in February 1999, the publication of the UK HICP will now be brought forward to coincide with the release of the RPI and RPIX<sup>2</sup>.

### **How does the UK HICP differ from the Retail Prices Index?**

4. The UK HICP has been calculated from the same raw price data as the RPI. There are, however, a number of methodological and coverage differences:

Expenditure weights in the HICP are based on the purchasing patterns of all private households. The RPI excludes the expenditure of the top 4 per cent of households by income and pensioner households that derive over three-quarters of their income from state benefits.

The HICP aggregates prices at the elementary level (below which expenditure weights are not available) by taking the geometric mean of individual price quotes for items within each group. The RPI uses alternative formulae - the so-called average of relatives and the ratio of averages. Further detail can be found in Annex 1.

Different product coverage. The major difference is the exclusion of several main components of housing costs from the HICP: specifically, mortgage interest payments, council tax and housing depreciation, which have a weight of just over 10 per cent in the RPI and 6.5 per cent in RPIX. Some health series such as NHS prescriptions and dental charges are also excluded from the HICP, whilst there are alternative methodological treatments for both insurance and new cars. Details are given in Annex 2.

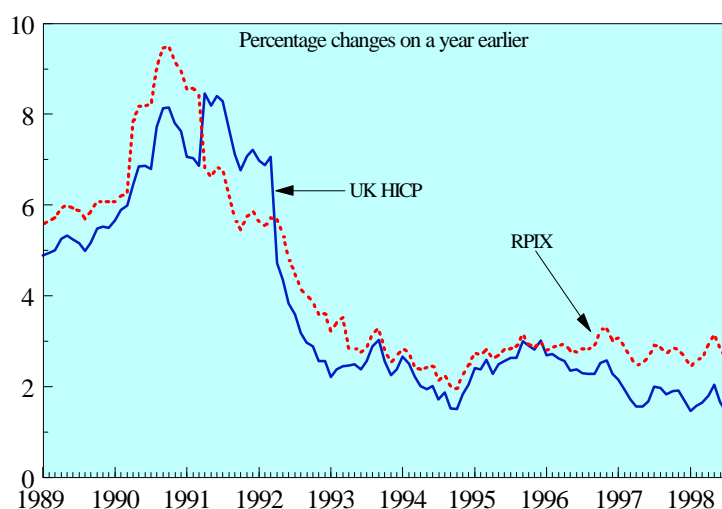
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<sup>2</sup> ONS News Release 'HICP to be published together with RPI', 17 November 1998.

## HICP inflation 1989-1998<sup>3</sup>

5. Eurostat publish monthly HICP data for each of the 15 EU member states (plus Norway and Iceland), with index level data back to January 1995, and 12-month inflation rates back to January 1996. The UK index as calculated by the ONS was previously only available from January 1996, with inflation rates from January 1997 (UK rates back to January 1996 were as calculated by Eurostat). However, the ONS has now calculated HICP inflation rates back to 1989 using the geometric mean to aggregate the individual price quotes. The HICP data prior to 1996 have been based on the population coverage of the RPI.

**Chart 1: UK HICP and RPIX: 1989-98**



6. A detailed breakdown of the differential between RPIX and HICP inflation over the period January 1989 to August 1998 can be found in Annex 3. A summary analysis shows:

HICP inflation has been 0.48 percentage points lower than RPIX inflation on average over this period. Of this, about 0.1 percentage points can be attributed to differences in coverage and 0.38 percentage points to the geometric mean effect.

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<sup>3</sup>An ONS article on these data will appear in the December 1998 edition of Economic Trends. It will be available from the ONS press office from 17 November. The detailed data will also be available from that date. A previous ONS article on the HICP - 'Harmonised Indices of Consumer Prices' - was published in the March 1988 edition of Economic Trends.

The differential between HICP and RPIX inflation has not been stable, ranging from HICP inflation being 1.55 percentage points lower (March 1991) to 1.64 percentage points higher (April 1991) than RPIX inflation.

The volatility in the differential between the two indices is primarily due to the coverage effect. The differential due to the geometric mean effect will always reduce HICP relative to RPIX inflation, with the size of this effect varying between 0.21 percentage points (in early 1989) to 0.56 percentage points (in March 1997 and June 1998).

The volatility of the two series is similar. The standard deviation of HICP inflation between January 1989 and August 1998 is 2.18 percentage points, compared with 2.05 percentage points for RPIX inflation.

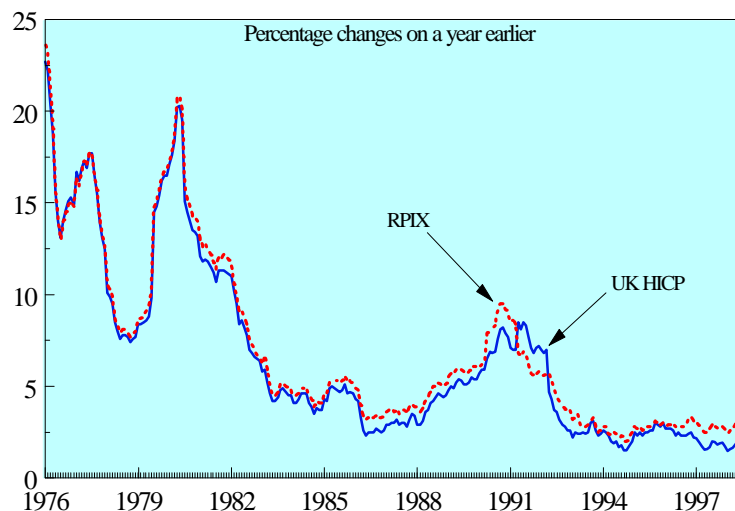
7. There is only a brief period, between April 1991 and March 1992, during which HICP inflation has been above RPIX inflation. This was the result of Government induced price changes. In the March 1991 Budget, the Government announced cuts in the community charge which were accompanied by an increase in the standard rate of VAT from 15 per cent to 17.5 per cent. RPIX included both the headline community charge and VAT. However, while the HICP includes VAT, it excludes the community charge. The result is that the HICP rate is boosted by over 1 percentage point relative to the RPIX rate for the twelve months from April 1991.

8. Taking a recent observation, RPIX and HICP inflation were 2.5 per cent and 1.3 per cent respectively in August 1998. The formula effect accounts for 0.54 percentage points of the differential, and the coverage effect accounts for 0.67 percentage points. Council tax and housing depreciation are responsible for two-thirds of this coverage effect.

## HICP inflation 1978-1998

9. The ONS has also calculated indicative HICP inflation rates back to 1976. These have not been calculated from the original price quotes, but coverage differences have been allowed for and a geometric mean effect of 0.25 percentage points assumed prior to 1989.

**Chart 2: UK HICP and RPIX: 1976-98**



10. A summary analysis of the whole period shows :

HICP inflation has been 0.47 percentage points lower than RPIX inflation on average over the period from January 1976 to August 1998<sup>4</sup>. Coverage differences account for 0.17 percentage points of the difference.

The standard deviation over the whole period for both HICP and RPIX inflation is 4.9 percentage points.

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<sup>4</sup> This calculation is dependent on the geometric mean assumption of 0.25 percentage points made for 1976 to 1988

**Annex 1 : The geometric mean effect**

A1. There are three main formulae for averaging together individual price quotes for items within weighting groups. If prices  $P_{1(0)}$  to  $P_{n(0)}$  are collected in the base month 0, and prices  $P_{1(t)}$  to  $P_{n(t)}$  are collected in month t, the three formulae are as follows :

Average of Relatives (AR) :

$$(1/n) \sum_{i=1}^n (P_{i(t)}/P_{i(0)})$$

Ratio of Averages (RA) :

$$(\sum_{i=1}^n P_{i(t)}/n) / (\sum_{i=1}^n P_{i(0)}/n)$$

Geometric Mean (GM) :

$$[\prod_{i=1}^n (P_{i(t)}/P_{i(0)})]^{1/n}$$

The RPI adopts the first two formulae only. The AR method is used for about half of locally collected prices in the RPI. The UK HICP uses only the GM formula.

A2. The choice of formulae at the most disaggregated level has a number of implications:

The GM formula will always give a lower result than the AR approach unless price relatives (i.e. prices in the current month relative to those in the base month) are all equal, in which case the two formulae will give the same result. The difference between the GM and AR outcomes is broadly proportional to the variance of price relatives.

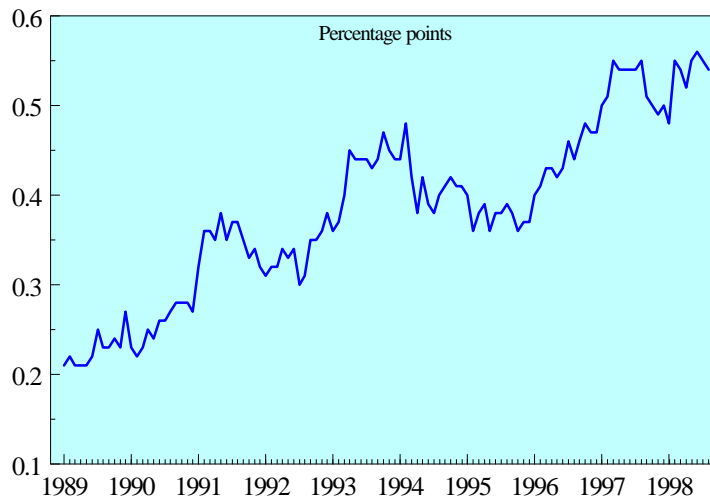
The AR and RA formulae implicitly assume no substitution between products or retail outlets takes place when relative prices change. The GM formula assumes that elasticities of substitution between different products or outlets are equal to -1. This is equivalent to assuming that expenditure shares remain constant. For

example, if the price of one good doubles, whilst all other prices remain unchanged, the quantity bought of that good will halve.

The suitability of a particular formula will thus depend on how much substitution does take place in response to price changes. In general, it is rather more plausible to assume elasticities of substitution closer to -1 than zero, although not necessarily so for particular products.

A3. The ONS has calculated the HICP index back to 1988 (inflation rates back to 1989) using the GM to aggregate individual price quotes. Chart A1 indicates that using the GM formula rather than a combination of AR and RA lowers measured inflation over the recent past by around 0.5 percentage points. This is a much larger effect than found in the US (the Boskin Report suggested a 0.15 percentage point effect) or in Europe (Austria, Finland, France and Greece found a 0.1 percentage point impact). The reasons for the larger GM effect in the UK are being analysed by the ONS as part of their research programme on aspects of RPI methodology<sup>5</sup>.

**Chart A1: Effect of geometric mean in lowering measured inflation**



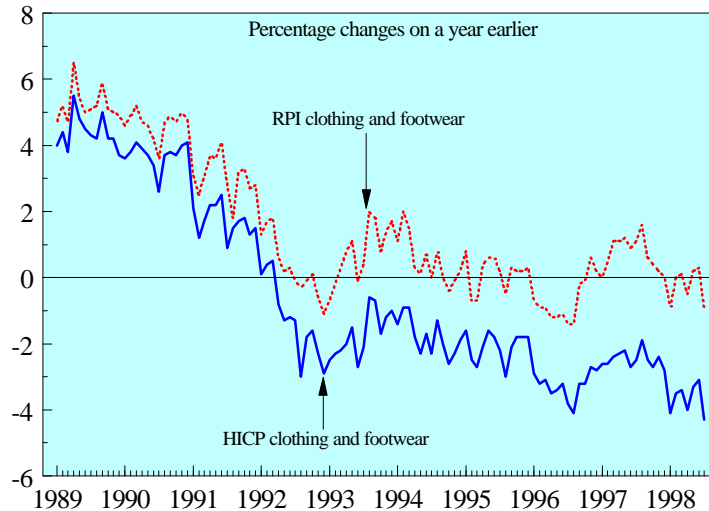
A4. A breakdown of the HICP between different categories of expenditure indicates that the GM effect is concentrated in two categories of goods - clothing and footwear and household goods:

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<sup>5</sup> 'Implications of the US Boskin Report for the UK Retail Prices Index', Economic Trends, October 1997.

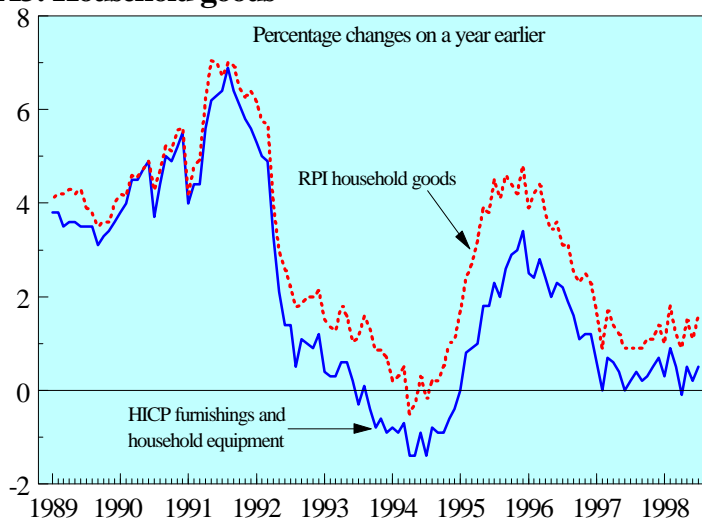
Clothing and footwear : The effect of the GM is dramatic. HICP inflation in this sector has been continuously negative since April 1992. By contrast, the RPI has recorded low but positive inflation rates for clothing and footwear over much of the period, with falling prices only in late 1992, 1996 and in recent months.

**Chart A2: Clothing and footwear**



Household goods : The comparison between the RPI and HICP for this category of expenditure is complicated by slightly different product coverage, but again there is a noticeable GM effect.

**Chart A3: Household goods**



A5. The large gap between the RPI and HICP inflation rates for these two categories of expenditure can seemingly be traced to two main factors which raise the variance of

price relatives, and hence the gap between the GM and AR formulae. The latter is used for these goods in the RPI.

The use of January as the base month for the RPI. Prices in January are atypical because of the widespread discounting in sales during the month. This will raise the variance of price relatives. Discounting is most prevalent in the clothing and footwear and household goods sectors, and so it is not surprising that the downwards effect from using the GM formula is biggest here. France uses December as its base month.

The ONS method of price collection may also affect the size of the GM effect. Collectors are given generic descriptions for items, such as a double wardrobe. This contrasts with countries such as France and Austria which define items much more tightly to ensure that the sample of prices collected is much more homogenous. The advantage of the heterogeneous collection of items in the UK is that it improves the coverage of the RPI. The ONS is looking into this issue, and it is possible that if the ONS were to change the method of price collection this could reduce the effect of the GM and raise the HICP inflation rate relative to the RPI.

## **Annex 2 : Coverage differences**

### **(a) Housing Costs**

The RPI includes three components of housing costs - mortgage interest payments, housing depreciation and the council tax - which are not included in the HICP.

The mortgage interest component of the RPI is rather volatile and has the perverse effect of raising recorded inflation when interest rates are increased. The comparisons in this paper are between the HICP and RPIX inflation so as to exclude such effects.

Housing depreciation has been included in the RPI since the start of 1995. This is intended to represent the expenditure that all owner-occupiers would find necessary to maintain their house at constant quality. A smoothed index of house prices is used as a proxy. The buoyant growth of house prices over the past year has boosted the RPI relative to the HICP.

The council tax is included in the RPI, in effect being treated as an indirect tax on housing for RPI purposes (unlike in the national accounts). The effect of the community charge, the predecessor to the council tax, on the RPI in 1991-92 was discussed in paragraph 7. More recently, council tax increases have boosted the gap between RPIX and HICP inflation in each of the past four years.

The absence of housing costs in the HICP is due to the difficulties in agreeing a common treatment of such costs. National consumer price indices adopt differing treatments, with some countries including an imputed rent measure (i.e. the rent paid for an equivalent dwelling) whilst others, such as the UK, include mortgage interest payments. Both of these approaches have been criticised. Imputed rents can be seen as an opportunity cost rather than an actual cost. Mortgage interest payments can be regarded as a cost of borrowing rather than a cost of consuming housing services.

Eurostat plan further discussion of this issue, and the two most likely options are the continued exclusion of such costs or an index which covers the prices faced by owner-occupiers when acquiring housing. Any extension of coverage to embrace such costs is unlikely before 2000.

(b) Insurance

The treatment of insurance varies between the HICP and the RPI. The weight given to insurance in the HICP is based on the net expenditure on insurance (i.e. the cost of insurance premiums less the amount paid out in claims). In the RPI, the weight depends on gross expenditure. However, both indices use gross premium prices as the price change indicator. The effect of the weighting difference will generally be small unless there are large swings in prices as occurred during 1995 and 1996.

(c) Other coverage differences

Personal computers were included in the HICP in 1996, two years ahead of their introduction into the RPI.

New cars : The HICP differs from the RPI in its treatment of new car prices. The HICP uses quality-adjusted list prices whilst the RPI uses second-hand car prices as a proxy. This is currently the only component of the HICP which is narrowing the gap between it and RPIX. The widespread discounting of new cars at certain times will have a knock-on effect on used cars but will not directly affect list prices.

Air fares are included in the HICP but not in the RPI. But there is an indirect effect from air fares on the RPI through their effect on the cost of travel packages.

HICP coverage in the health sector will be expanded in December 1999 to include items such as NHS prescriptions and dental charges, both of which are already included in the RPI.

### Annex 3 : Reasons for difference between RPIX and HICP Inflation

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 *
<i>Per cent</i>										
RPIX inflation	5.9	8.3	6.8	4.7	3.0	2.4	2.8	2.9	2.8	2.7
HICP inflation	5.2	7.1	7.5	4.3	2.5	2.0	2.7	2.5	1.8	1.6
<i>Percentage points</i>										
Contributions to HICP minus RPIX:										
- Geometric mean effect	-0.23	-0.26	-0.35	-0.33	-0.43	-0.41	-0.38	-0.44	-0.52	-0.54
- Council Tax	-0.16	-0.92	1.18	0.25	0.22	0.09	-0.06	-0.12	-0.14	-0.17
- Housing depreciation							0.08	-0.04	-0.08	-0.19
- Net weights for insurance	-0.10	0.05	-0.12	-0.17	-0.19	-0.02	0.12	0.21	-0.03	-0.12
- PCs								-0.07	-0.12	-0.10
- Other differences**	-0.17	0.03	0.01	-0.16	-0.09	-0.03	0.04	-0.01	-0.04	0.06
<b>Total difference</b>	<b>-0.66</b>	<b>-1.10</b>	<b>0.72</b>	<b>-0.41</b>	<b>-0.49</b>	<b>-0.37</b>	<b>-0.20</b>	<b>-0.47</b>	<b>-0.93</b>	<b>-1.06</b>

\* To September.

\*\* Includes other coverage differences and the impact of separate rounding of RPIX and HICP inflation rates.