The Construction of RPIY

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and

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Abstract

This paper outlines the calculations used to construct the Bank of England's measure of retail price inflation which excludes the effects of indirect taxes on final consumption, mortgage interest payments and local authority taxation. This measure of inflation has been constructed in order to yield more information on changes in underlying inflation than is afforded by the Government's target measure of retail price inflation, RPIX, which excludes only mortgage interest payments.

1. Introduction

Like most other economic concepts, such as money or output, there is no unique way to measure price inflation. Rather, there are many different aggregate price measures, any of which could be used to measure the change in prices over time. For the purposes of its inflation target, the Government has chosen to measure inflation by the twelve-month growth rate of the Retail Prices Index (the RPI) excluding the element of that index relating to mortgage interest payments (MIPs). This measure is known as RPIX inflation.

In monitoring and predicting the course of inflation, the Bank of England has developed a further price index known as RPIY. RPIY is based on the components of RPIX but strips out the elements directly relating to taxation[1] - value added tax (VAT), air passenger duty, insurance premium tax, local authority taxes, vehicle excise duty, and duties on tobacco, alcohol and hydrocarbons.

The Bank's motivation for constructing RPIY is that it provides an additional measure of underlying inflation, and one that does not reflect the immediate impact of changes in indirect taxes. The technical reason for wanting to strip out the effects of taxation is similar to that for excluding MIPs from the target measure. A change in indirect taxes will usually cause a step change in the RPIX level (although often spread over a period of two or three months). This in turn will lead to a temporary change in the twelve-month inflation rate for at least a year. Hence tax changes introduce a "noise" element in the inflation rate. If one is concerned with price inflation in the medium term then it is useful to know what the effect of this noise is.

The rest of this paper describes in full detail the technical aspects of constructing the RPIY. This construction inevitably involves a number of approximations due to data constraints and these approximations are laid out.

2. Limitations on the scope of RPIY

In understanding how RPIY is constructed and used, it is important to understand the limits of the calculation. There are three important issues concerning indirect tax rates which are not reflected in the RPIY calculation.

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(1) RPIY does not exclude car tax, which was levied on new car sales prior to November 1992, as the price of new cars does not currently form part of the RPI.

RPIY does not strip out all tax effects on prices. In particular we do not remove direct taxes on factors of production (eg employer's national insurance contributions) or on intermediate production stages (eg petroleum revenue tax). RPIY also does not deal with subsidies and hence is not a true "factor cost" measure of retail prices.

RPIY does not attempt to model economic behaviour. It does not predict what prices would have been in the absence of tax changes since this would require a full model of the demand for, and supply of, each expenditure category.

When duties or VAT are raised, retailers will often hold their prices for a month or two, taking the tax increase out of their profit margins. In these instances the RPIY prices of those items fall, since the prices received by the retailer have gone down. The only explicit assumption made is that the increased taxes are effective on the retailer from a particular date - no assumption is made regarding retailers' subsequent behaviour in passing on the tax change to the consumer via higher prices.

3. An overview of the construction of RPIY

3.1 RPI construction

The RPI is a chain-weighted index.(2) The weights for individual prices are updated in February each year, taken from the annual Family Expenditure Survey (FES) for the twelve months to June the previous year. For example, the weights used from February 1994 to January 1995 are taken from FES data collected from July 1992 to June 1993. Changes between June 1993 and January 1994 are taken into account by using relative changes in the prices themselves over this period assuming no change in quantity. The weights are proportionate to expenditure and sum to 1,000. The RPI is then rebased to equal 100 in January 1987.

The chain linking ensures that the January level for the index would be the same whether old weights or new weights were used. In this way the series for each year are spliced together.

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(2) For a description of chain linking, see Turvey R, 'Consumer Price Indices', (1989) also see Appendix 2 for a numerical example.

3.2 The steps in RPIY construction

The Central Statistical Office (CSO) provide the disaggregated price indices and weights used to construct RPI. Excluding MIPS and the Council Tax is trivial in that these series are simply ignored and the weights for the other series can be scaled up to sum to 1,000. The resulting series we shall call RPIXC.(3)

Indirect taxes take two forms. VAT is an "ad valorem" tax which operates as a percentage on the retail price; the current rate being 17.5% on most items and zero on others (but 8% on domestic fuel and power since April 1994). Duties are levied in cash terms on units of consumption (eg £1.02 on a bottle of wine). But these taxes not only affect the relative prices, they also affect the relative weights since the weights are based on expenditure shares. The RPIXC weights are reduced to their ex-tax levels so that the relative weight of each ex-tax cost component is the same in RPIY as in RPIXC. We therefore have four basic calculations to make to obtain the building blocks of RPIY:

(i) removal of VAT from each RPIXC price component;
(ii) removal of duties from each RPIXC price component;
(iii) removal of VAT from each RPIXC weight; and
(iv) removal of duties from each RPIXC weight.

Once these calculations are made it is relatively simple to calculate RPIY by the following steps:

(v) multiply up the weights so that they sum to 1,000;
(vi) re-aggregate for each year; and
(vii) re-chainlink, overlapping in January.

Ideally we would like to apply steps (i)-(iv) for every one of the 600 item prices used to construct RPIXC. This is neither practical nor possible since the required information is not available to the Bank in sufficient detail. We have chosen to divide RPIXC into 26 sub components (listed in Appendix 1) based on the 74 published components of the RPI.

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(3) At present the weights for RPIXC sum to 926 and it is these weights we use as our starting point when calculating the weights for RPIY. We multiply up all the weights to sum to 1,000 immediately before chain linking. This allows us to rescale only once and the results are equivalent.

3.3 Liability for VAT

The breakdown chosen is based on data availability and does not exactly match the division between those goods and services which attract duties and/or VAT and those which are exempt. For example the element of the clothing and footwear series which corresponds to children's clothes does not incur VAT. However, no definitive figures are published for the proportion of childrens' clothes in the clothing and footwear series, hence we have used the CSO's best estimates of the proportion in such a case and VAT is not removed from this element of the clothing and footwear series.

In the rest of this paper, we work through the steps described above, with additional material presented in appendices. The information is intended to be sufficient for the reader to reconstruct RPIY from a combination of these appendices and previously published data sources.

4. Removing VAT and Duty from RPIXC Components

In order to identify separately the ex-tax elements of the 26 components which make up RPIY, it is necessary to remove VAT from 16 components and both VAT and duty from five. One of these five series needs to be split into two for the calculations and this is treated as a special case in Section 6.1. One further series has just a duty component and this is treated as a special case in Section 6.2. The remaining four components carry neither VAT nor duties. This section provides the formulae needed to calculate the factor cost prices and illustrates using numerical examples.

4.1 Removing VAT

The proportions of each component liable for VAT, in general, change slowly over time. However, for simplicity we assume that they are constant and use the most up-to-date estimates of those proportions (listed in Appendix 1). Given these proportions, the removal of VAT from the sub-components of RPIXC is a relatively simple process. We merely divide the published price components by one plus the appropriate rate of VAT, ie each component price series is reduced to its tax exclusive level. Each component is then rebased so that January 1987 equals 100.

$$y(t,j) = \frac{z(t,j) \cdot 100}{z(1,j)}$$

$$z(t,j) = \lambda(j).x(t,j) + (1-\lambda(j)).\frac{x(t,j)}{[1 + \tau(t,j)]} \quad (1)$$

where $y(t,j)$ is RPIY sub-component j, j=1, ..., 16 in period t;
period 1 is January 1987 (in which $y(1,j) = 100$);
$x(t,j)$ is RPIXC sub-component j, ie including VAT;
$\lambda(j)$ is the proportion exempt from VAT;
$\tau(t,j)$ is the appropriate VAT rate for sub-component j.

Example 1:

Table A
CHBH: Household Goods

The proportion liable for VAT = 100%

	RPIXC Sub-Component Index Including VAT (Jan 87=100)	**VAT Rate (per cent)**	**Sub-Component Index Excluding VAT (index)**	**RPIY Rebased Sub-Component Index Excluding VAT (Jan 87=100)**
	x	τ	z	y
1987 Jan.	100.0	15.0	87.0	100.0
1988 Jan.	103.3	15.0	89.8	103.3
1989 Jan.	107.5	15.0	93.5	107.5
1990 Jan.	112.0	15.0	97.4	112.0
1991 Jan.	116.7	15.0	101.5	116.7
1992 Jan.	123.9	17.5	105.4	121.3
1993 Jan.	125.8	17.5	107.1	123.1
1994 Jan.	126.1	17.5	107.3	123.4

As can be seen from Table A,[4] once the series has been rebased the removal of VAT has no effect until the rate of VAT changes in April 1991. Thus removing VAT has the same effect as reducing it to the rate which applied at January 1987. This is a result of the 'ad valorem' nature of VAT.

4.2 Removing VAT and Duty

At the level of disaggregation we have chosen, there are five series within the RPIXC which contain both duty and are liable (100%) for VAT. As Customs and Excise duties are set in cash terms per unit rather than as a percentage of the price, it is necessary to determine the cost of goods in cash terms before the duty can be removed. This is done by taking cash prices (for January 1987 for representative items; prices listed in Appendix 1) and multiplying by the published price index. From the cash series, VAT is removed, then duty subtracted. (VAT is levied on the total cost including the duty element.) These cash series are then converted back to indices (see formula (2) below).

$$y(t,j) = \frac{z(t,j) \cdot 100}{z(1,j)}$$

$$z(t,j) = \frac{x(t,j) \cdot p(j)}{x(1,j) \cdot [1 + \tau(t,j)]} - \delta(t,j) \qquad (2)$$

where $y(t,j)$ is RPIY sub-component j, j=17, ..., 21 in period t;
period 1 is January 1987 (in which $y(1,j) = 100$);
$x(t,j)$ is RPIXC sub-component j, including VAT and duties;
$\tau(t,j)$ is the appropriate VAT rate for sub-component j;
$p(j)$ is the cash price of the representative item in January 1987;
$\delta(t,j)$ is the duty charged on that item in period t.

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(4) In Tables A and B numerical examples are shown for January each year in order to show how, when indirect taxes change, removing them affects the RPIXC components. January has been chosen to reinforce the point that the tax exclusive component must equal 100 in January 1987.

Example 2:

Table B
DOBN: Cigarettes (see footnote 4 on page 10)

p = £1.43, the price in January 1987.

	RPIXC Sub-Component Index Including Tax (Jan 87=100)	**Cash Value (£)**	**VAT Rate (per cent)**	**Duty Content (£)**	**Sub-Component Excluding Tax (£)**	**RPIY Rebased Sub-Component Excluding Tax Index (Jan 87=100)**
	x	$p.x$	τ	δ	z	y
1987 Jan.	100.0	1.43	15.0	0.95	0.29	100.0
1988 Jan.	101.7	1.45	15.0	0.96	0.31	105.2
1989 Jan.	105.9	1.51	15.0	0.99	0.32	110.5
1990 Jan.	108.4	1.55	15.0	1.00	0.34	118.2
1991 Jan.	118.4	1.69	15.0	1.10	0.37	127.5
1992 Jan.	138.0	1.97	17.5	1.27	0.41	139.8
1993 Jan.	150.8	2.16	17.5	1.40	0.43	148.5
1994 Jan.	167.8	2.40	17.5	1.61	0.43	147.6

By January 1994 the RPIY cigarettes series is considerably lower than that for RPIXC. However, between 1987 and 1992 the RPIY series exceeds that for RPIXC. This is simply as a result of the growth in the non-tax component over the period being greater than the combined increase in duty and VAT.

5. Removing VAT and Duty from Published RPIXC Weights

16 of the weights series must have only VAT removed, five have the effects of both VAT and duties, whilst one has just a duty component.

5.1 Timing

Over recent years, changes in Customs and Excise duties and VAT have been implemented in April. Since the first unified Budget in November 1993 changes have taken place in December and January and this will now be the usual practice. However, the published weights for the RPI apply from February each year.

In generating the new weights we use average VAT and duty figures from the same time period as the original price data from the FES, eg averages from July 1992 to June 1993 to produce the February 1994-January 1995 weights.

5.2 Removing VAT

To remove VAT from the RPIXC weights requires a similar calculation to that used to remove VAT from the price components. However, as noted above, it is necessary to use VAT figures from the period covered by the FES, taking a simple average of the VAT rate over each of the twelve month periods July to June and using these figures in the formula to remove VAT (see formula (3) below).

$$w(t,j) = \lambda(j) \cdot v(t,j) + \frac{[1 - \lambda(j)] \cdot v(t,j)}{(1 + \bar{\tau}(s,j))} \qquad (3)$$

where $w(t,j)$ is the (provisional) RPIY weight for component j, j=1,..,16 in period t;
$\lambda(j)$ is the proportion exempt from VAT;
$v(t,j)$ is the RPIXC weight;
$\bar{\tau}(s,j)$ is the average rate of VAT over the relevant July to June period.

Example 3:

Table C
CHBH: Household Goods[5]

The proportion liable for VAT = 100%.

	RPIXC Weight	Average VAT Rate (per cent)	RPIY Weight Excluding VAT
	v	$\bar{\tau}$	w
1987 Feb.	73	15.0	63
1988 Feb.	74	15.0	64
1989 Feb.	71	15.0	62
1990 Feb.	71	15.0	62
1991 Feb.	70	15.0	61
1992 Feb.	77	15.6	67
1993 Feb.	79	17.5	67
1994 Feb.	76	17.5	65

After removing taxes from the weights, their sum is clearly reduced from the 926 starting point (the weight of RPIXC in the RPI). This is corrected when re-scaling the weights back up to 1,000 for the final RPIY calculation and explains why it is not necessary to scale up the RPIXC weight in the first place - one operation covers both.

5.3 Removing VAT and Duty

In order to remove both VAT and duty from the weights it is necessary to carry out the following steps:

(i) calculate the average cash value over the relevant July-June period based on an initial price;
(ii) remove VAT;
(iii) remove the duty content;

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(5) In Tables C and D, February has been chosen as the example month as it is the first month in which that year's weights are applied.

(iv) take the remainder as a proportion of the original cash value; and

(v) multiply the result by the original RPIXC weight.

$$w(t,j) = \left[\frac{\bar{a}(s,j)}{(1 + \bar{\tau}(s,j))} - \bar{\delta}(s,j) \right] . \frac{v(t,j)}{\bar{a}(s,j)}$$

$$\bar{a}(s,j) = p . \frac{\sum_{i=1}^{12}}{12} \left[\frac{\bar{x}(s,i,j)}{x(1,j)} \right] \qquad (4)$$

where $w(t,j)$ is the provisional RPIY weight for component j, j = 17,..., 21 in period t;

$\bar{a}(s,j)$ is the average cash value over the relevant July-June period s, (s = 1 for July 1985-June 1986);

$\bar{\tau}(s,j)$ is the average VAT rate over period s;

$\bar{\delta}(s,j)$ is the average duty content over period s;

$v(t,j)$ is the RPIXC weight;

$\bar{x}(s,i,j)$ is the average RPIXC price component j in month i of the July-June period s;

$x(1,j)$ is the RPIXC price component j in January 1987;

p is the initial period price ie January 1987.

Example 4:

Table D
DOBN: Cigarettes (see footnote 5 on page 13)

p = £1.43 The price in January 1987
v = 100.0% The proportion liable for VAT

	RPIXC sub-component index Including tax (Jan 87=100)	Cash Value (£)	Average Cash (£)	Average VAT (per cent)	Average Duty (£)	RPI Weight (£)	RPIY Weight
	x	$p.x$	a	τ	γ	v	w
1987 Feb.	99.9	1.43	1.31	15.0	0.87	33	7
1988 Feb.	101.9	1.45	1.43	15.0	0.95	32	7
1989 Feb.	106.0	1.52	1.45	15.0	0.96	32	7
1990 Feb.	108.5	1.55	1.51	15.0	0.99	30	6
1991 Feb.	118.5	1.69	1.56	15.0	1.02	28	6
1992 Feb.	138.1	1.97	1.73	15.6	1.13	32	7
1993 Feb.	150.8	2.15	1.98	17.5	1.30	31	6
1994 Feb.	168.3	2.41	2.16	17.5	1.42	32	6

6. Special cases

The formulae given in Sections 4 and 5 are used to remove VAT and duty, where appropriate, from the majority of components and weights of RPIXC. There remain two series which require distinctive treatment before they can be used to calculate RPIY.

6.1 Wines and spirits

The CSO publish an aggregate series for wines and spirits and this is one of our five sub-components that contain both VAT and duty. Individual series for wines and spirits are not available and as duty is set differently for wines and spirits, this poses a problem. The way in which this has been solved is to make the assumption that the prices of wines and spirits (including duty) have risen at the same rate. Thus, in order to calculate the two cash value series it is necessary to take separate initial prices for each of wines and spirits and use

the same aggregate index series to produce the two cash value series. The CSO have provided the individual weights for wines and spirits (see Appendix 1) so the process described in Section 4.2 can then be applied to each. The two series are then chain weighted and re-aggregated to form a single subcomponent of RPIY. With respect to the individual weights for wines and spirits, calculated as described in Section 5.3, these can be aggregated using the CSO's weights to form a single weight for wines and spirits.

6.2 Car tax and insurance

The CSO publish an aggregate price sub-component which contains both vehicle excise duty (VED) and car insurance. VED differs from other duties in being a fixed charge which is not related to a new purchase ie similar to the Council Tax. In order to remove VED from the aggregate series a different approach has been adopted from that used to remove other duties.

As data on VED per vehicle are available, an index for this can be calculated. In order to remove VED, it is necessary to estimate its proportion in the sub-component and subtract this from the total ie the subcomponent is reduced to a car insurance series only. Weights provided by the CSO can be used to calculate the proportion of the RPIXC weight that corresponds to the car insurance element of the aggregate series. We calculate the one-month changes in the aggregate series and subtract from those the weighted one-month growth rates of VED. The resultant series gives the weighted growth rates of the car insurance component. Then, by unweighting these growth rates and using a base of 100 in January 1987, a car insurance series is produced.

7. Aggregation

The provisional RPIY weights are added to the weights for the remaining components, ie the four on which VAT and duty are not levied, from this we derive the multiplication factor so that they can be scaled up to sum to 1000. These weights are then combined with the corresponding price series using chain weighting[6] to calculate RPIY.

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(6) See *Central Statistical Office* London: HMSO (1991), 'Retail Prices 1914-1990', pages 107-8, from which the numerical example in Appendix 2 has been taken.

8. Some points on interpretation of RPIY and its relation to RPIX

The RPIY is a distinct index from RPIX. Because the weights are changed, as well as the prices, RPIY and RPIX can move differently even when taxes are unchanged. For example, seasonal food, on which there are no taxes or duties, has a higher weight in RPIY than in RPIX. Hence if the price of seasonal food rises faster than other prices, RPIY can grow faster than RPIX.

One can use the same calculations to construct an index of indirect taxes - but changes in the tax index plus changes in the RPIY index will not necessarily sum to the changes in RPIX.

In the introduction we pointed out that no behavioural assumptions are made in constructing RPIY. If taxes go up and retailers hold their prices then the RPIY will fall. If prices rise subsequently to recover the retailers margin then RPIY will rise. Hence RPIY can be more volatile than RPIX around Budget times. To infer the implication for future inflation requires additional behavioural information.

The usefulness of RPIY can be ascertained by comparing the recent profiles of RPIX and RPIY inflation shown in Chart 1 below. RPIY clearly shows an upward movement following the suspension of sterling from the Exchange Rate Mechanism in September 1992 - this movement is much more clear than in RPIX. Also the movement in RPIY shows continuing downward momentum in retail price inflation since September 1993 - pressure which has been partially obscured in RPIX by indirect tax increases.

The existing index is sufficiently accurate to add to our understanding of recent price movements but could be substantially improved by working at item level. Calculating RPIY at a more disaggregated level would avoid most of the approximations and assumptions described above including the assumption that the proportion of a component liable for VAT remaining constant over time.

Following discussions between the Bank and the CSO, it has been agreed that further development of the RPIY index would be best undertaken by the CSO who have access to the individual item prices. The CSO will begin publication of the improved series from March 1995.

Chart 1

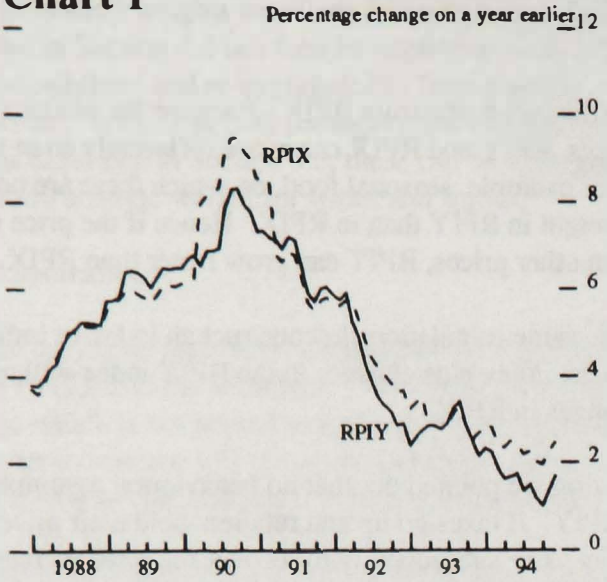
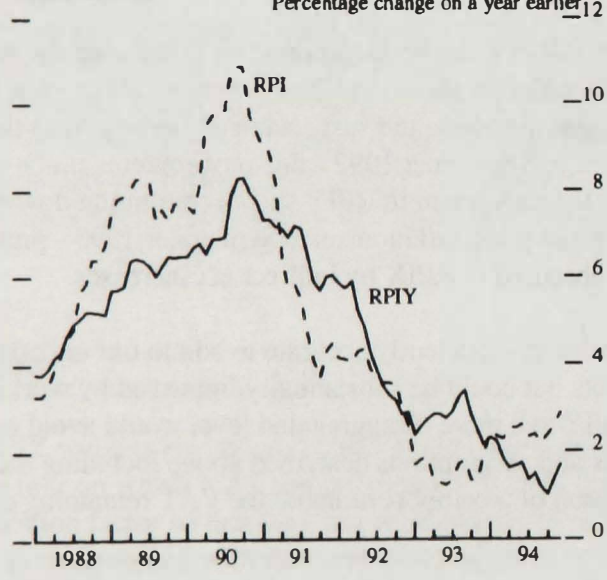


Chart 2



Appendix 1

j	CSO code	Series title	Proportion liable for VAT (per cent)
1	CHBB	Non-seasonal food	24.0
2	CHBC	Catering	91.0
3	CHBG	Fuel & light	100.0
4	CHBH	Household goods	100.0
5	CHBI	Household services	79.0
6	CHBJ	Clothing & footwear	81.0
7	CHBL	Leisure goods	72.0
8	CHBM	Leisure services(7)	40.0
9	CHBR	Fares	45.0
10	DOBT	Repairs	100.0
11	DOBU	DIY	100.0
12	DOCP	Personal articles	100.0
13	DOCQ	Chemist goods	97.0
14	DOCR	Personal services	100.0
15	DOCS	Car purchase	8.0
16	DOCT	Car maintenance	96.0
17	DOBH	Beer	100.0
18	DOBK	Wine and spirits	100.0
19	DOBN	Cigarettes	100.0
20	DOBO	Other tobacco	100.0
21	DOCU	Petrol	100.0
22	DOCV	Car tax & insurance	0.0
23	CHBP	Seasonal food	0.0
24	DOBP	Rent	0.0
25	DOBS	Water	0.0
26	DOBV	Dwelling insurance	0.0

(7) In February 1993 foreign holidays were included in this component and from February 1994 UK holidays formed part of the index. The introduction of these two sub-components increased the proportion liable for VAT from 40% to 80%. We have chosen to continue to use 40% until a full year's data for the new index are available.

CSO weights

	Wines	Spirits	Total	Car tax	Car insurance	Total
1987	51	49	100	43	57	100
1988	56	44	100	39	61	100
1989	61	39	100	39	61	100
1990	61	39	100	40	60	100
1991	52	48	100	38	62	100
1992	50	50	100	36	64	100
1993	54	46	100	34	66	100
1994	55	45	100	35	65	100

Initial Prices
January 1987

		Sources
Pint of Beer	£0.81	CSO
Bottle of Wine	£2.29	HMT
Bottle of Spirits	£8.09	HMT
Packet of 20 Cigarettes	£1.43	CSO
Ounce of pipe tobacco	£2.60	Pipe smokers council
Litre of Petrol	£0.38	CSO

Sources

RPI components	CSO	RPI press release
RPI weights	CSO	Monthly digest of statistics
VAT and duties	HMT	Financial Statement and Budget Report

Appendix 2

Chain Weighting

The weights within the RPI change from year to year, the new weights being introduced with the February figures. These weights are calculated from Family Expenditure Survey data collected over the year ending in the June preceding the introduction of the new weights. However, these weights are adjusted to take account of relative price movements between the various components of the RPI which have taken place between June and the following January, ie immediately before the introduction of the new weights. To create an aggregate index, we start from a point where we have individual indices for each component and these series must then be chain weighted by two steps. The components are first weighted together for each year and then chain linked. This is easiest to explain with an example.

Suppose the objective is to calculate an aggregate index for Catering in respect of December 1990 (with January 1987 taken as 100), from its three components - Restaurants, Canteen meals and Take-away meals/snacks. The data required are as follows:

	Indices (reference base = 100)			Weights		
	Restaurants	Canteens	Takeaways	Restaurants	Canteens	Takeaways
Dec 1990	131.8	131.6	130.7	24	7	16
Jan 1990	122.2	120.6	120.0	26	7	16
Jan 1989	113.9	112.2	112.3	25	8	17
Jan 1988	106.5	106.5	106.3	23	7	16
Jan 1987	100.0	100.0	100.0			

The aggregate index for December 1990 (January 1990=100) is obtained by dividing the December figure by the figure for the previous January for each component. These ratios are then weighted and summed with total being divided by the sum of the weights:

$$\frac{24 * 131.8/122.2 + 7 * 131.6/120.6 + 16 * 130.7/120.0 * 100}{24 + 7 + 16} = 108.41$$

This calculation is then repeated for each January back to the base year (in this case 1987).

The aggregate index for January 1990 (January 1989=100) is:

$$\frac{26 * 122.2/113.9 + 7 * 120.6/112.2 + 16 * 120.0/112.3 * 100}{26 + 7 + 16} = 108.18$$

The aggregate index for January 1989 (January 1988=100) is:

$$\frac{25 * 113.9/106.5 + 8 * 112.2/106.5 + 17 * 112.3/106.3 * 100}{25 + 8 + 17} = 106.25$$

The aggregate index for January 1988 (January 1987=100) is:

$$\frac{23 * 106.5/100.0 + 7 * 106.5/100.0 + 16 * 106.3/100.0 * 100}{23 + 7 + 16} = 106.43$$

We then multiply the January figures together, dividing each by 100. Finally we multiply this figure by the index for December calculated above.

The linked aggregate index for December 1990 (January 1987=100) is therefore:

$$\frac{107.18 * 106.25 * 106.43 * 108.41}{100 * 100 * 100} = 131.4$$

These calculations can be repeated for each month. This simple example can be generalised to deal with any number of components and any number of linking years. For example, the index for RPIY is made up from 26 separate components.

Appendix 3

		RPIY Index	Percentage change on a year earlier
1987	Jan.	100.0	
	Feb.	100.5	
	Mar.	100.7	
	Apr.	101.5	
	May	102.0	
	June	102.0	
	July	101.8	
	Aug.	102.1	
	Sept.	102.5	
	Oct.	103.0	
	Nov.	103.5	
	Dec.	103.7	
1988	Jan.	103.8	3.8
	Feb.	104.2	3.8
	Mar.	104.6	3.9
	Apr.	105.7	4.2
	May	106.3	4.3
	June	106.8	4.7
	July	106.9	5.0
	Aug.	107.3	5.1
	Sept.	107.8	5.2
	Oct.	108.4	5.2
	Nov.	108.9	5.2
	Dec.	109.1	5.2
1989	Jan.	109.7	5.7
	Feb.	110.2	5.7
	Mar.	110.7	5.8
	Apr.	112.5	6.4
	May	113.2	6.4
	June	113.6	6.4
	July	113.6	6.3
	Aug.	113.8	6.0
	Sept.	114.6	6.3
	Oct.	115.4	6.5

		RPIY Index	Percentage change on a year earlier
	Nov.	115.9	6.5
	Dec.	116.2	6.5
1990	Jan.	116.8	6.5
	Feb.	117.6	6.7
	Mar.	118.2	6.8
	Apr.	119.8	6.5
	May	121.0	6.9
	June	121.4	6.9
	July	121.5	6.9
	Aug.	122.8	7.9
	Sept.	124.1	8.3
	Oct.	125.0	8.3
	Nov.	125.2	8.0
	Dec.	125.2	7.8
1991	Jan.	125.4	7.3
	Feb.	126.2	7.3
	Mar.	126.7	7.2
	Apr.	128.4	7.1
	May	129.4	6.9
	June	130.2	7.2
	July	130.1	7.1
	Aug.	130.7	6.5
	Sept.	131.4	5.9
	Oct.	132.2	5.7
	Nov.	132.7	6.0
	Dec.	132.8	6.1
1992	Jan.	132.7	5.9
	Feb.	133.5	5.8
	Mar.	134.2	5.9
	Apr.	135.1	5.3
	May	135.7	4.9
	June	135.7	4.3
	July	135.2	3.9
	Aug.	135.3	3.5

		RPIY Index	Percentage change on a year earlier
	Sept.	135.8	3.3
	Oct.	136.3	3.2
	Nov.	136.5	2.9
	Dec.	136.6	2.9
1993	Jan.	135.9	2.4
	Feb.	136.9	2.6
	Mar.	137.9	2.7
	Apr.	139.0	2.9
	May	139.5	2.9
	June	139.4	2.8
	July	139.1	2.9
	Aug.	139.7	3.3
	Sept.	140.4	3.4
	Oct.	140.2	2.8
	Nov.	139.9	2.5
	Dec.	139.6	2.1
1994	Jan.	139.1	2.3
	Feb.	140.0	2.2
	Mar.	140.4	1.9
	Apr.	141.3	1.6
	May	141.9	1.7
	June	141.9	1.7
	July	141.0	1.4
	Aug.	141.8	1.5
	Sept.	142.1	1.2
	Oct.	141.7	1.0
	Nov.	141.8	1.4
	Dec.	141.9	1.7

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