Annex A: How to use the GDP deflator series: Practical examples

NOTE – The GDP deflator data used to illustrate the worked examples shown throughout this annex were published by HM Treasury on 27 March 2013.

The following is an extract from a deflator series and provides examples of how the series can be used.

| Financial Year | GDP deflator at market prices | | GDP (£ million) | |
	GDP deflator 2011-12 =100	percentage change on previous year	Money GDP Cash	Money GDP Real Terms 2011-12 prices
2006-07	89.254	2.69	1,350,438	1,513,028
2007-08	91.478	2.49	1,432,887	1,566,373
2008-09	93.975	2.73	1,422,290	1,513,477
2009-10	95.389	1.50	1,415,654	1,484,085
2010-11	97.978	2.71	1,480,569	1,511,124
2011-12	100.000	2.06	1,524,550	1,524,550
2012-13	*101.300*	1.3	1,546,000	1,526,160
2013-14	*103.630*	2.3	1,595,000	1,539,131

data in italics have been added-in for the purposes of this example

Calculating Inflation Between Different years

In the above example there is a 2.71% increase in prices between 2009-10 and 2010-11

i.e. $\frac{(97.978-95.389)}{95.389} \times 100 = 2.71\%$

Q. What was the cumulative inflation between 2006-07 and 2011-12?

A. 12.04% increase between 2006-07 and 2011-12.

i.e. $\frac{(100 - 89.254)}{89.254} \times 100 = 12.04\%$

Inflating Figures

Q. How much would £7.40 million in 2009-10 prices be worth in 2013-14 prices?

A. Use the GDP deflator series which shows that in 2013-14 prices are higher than in 2009-10 by a ratio of 1.09 (103.630 ÷ 95.389).

i.e. $£7.40m \times \frac{103.630}{95.389} = £8.04m$

Therefore £7.40m in 2009-10 prices is equivalent to £8.04m in 2013-14 prices.

Deflating Figures

Q. How much would £85.32 million in 2011-12 prices have been worth in 2007-08?

A. Prices are lower in 2007-08 than 2011-12 by a factor of 0.91 (91.478 ÷ 100)

i.e. $£85.32m \times \frac{91.478}{100} = £78.05m$

Therefore £85.32m in 2011-12 prices is equivalent to £78.05m in 2007-08 prices.

Changing the Reference Year

It may be necessary to change the reference year you are working from.

The easiest way to achieve this is to divide all the deflators by the value of the deflator in the new reference year, then multiply by 100.

E.g. to rebase the series so that 2009-10 is the reference year (i.e. equal to 100)

2006-07	89.254 ÷ 95.389	×	100	=	93.568
2007-08	91.478 ÷ 95.389	×	100	=	95.900
2008-09	93.975 ÷ 95.389	×	100	=	98.518
2009-10	**95.389 ÷ 95.389**	**×**	**100**	**=**	**100.000**
2010-11	97.978 ÷ 95.389	×	100	=	102.609
2011-12	100.000 ÷ 95.389	×	100	=	104.834
2012-13	101.300 ÷ 95.389	×	100	=	106.197
2013-14	103.630 ÷ 95.389	×	100	=	108.639

Producing a Real Terms Series

To produce a real terms series, divide each value in the series by the given deflator for that year, and then multiply by the deflator for the year that you wish to be the reference year.

E.g. consider the following example which shows expenditure on **X** for 2007-08 to 2011-12, and suppose we wish to create a real terms series, with 2009-10 as the reference year.

Year	GDP deflator	Expenditure on X (£m)
2007-08	91.478	204
2008-09	93.975	219
2009-10	95.389	240
2010-11	97.978	258
2011-12	100.000	272

For 2007-08, divide £204m by 91.478 and multiply by 95.389 gives:

$$\frac{£204m \times 95.389}{91.478} = £212.72m$$

Similarly for the other years gives:

Year	GDP deflator	Expenditure on X (£m)	Real terms expenditure (£m) in 2009-10 terms
2007-08	91.478	204	212.72
2008-09	93.975	219	222.30
2009-10*	95.389	240	240.00
2010-11	97.978	258	251.18
2011-12	100.000	272	259.46

*Note that as 2009-10 is the reference year, actual expenditure is equal to real terms expenditure

How to Calculate a Real Terms Growth Rate

Following on from the example above you may wish to calculate a real terms growth rate. This will show year on year percentage growth rate in the real terms expenditure series. To get a real terms growth series simply calculate the year on year percentage growth rate of the real terms expenditure figures.

i.e. For 2008-09

$$\frac{(£222.30m - £212.72m)}{£212.72m} \times 100$$

Similarly for the other years gives:

Year	GDP deflator	Expenditure on X (£m)	Real terms expenditure (£m) in 2009-10 terms	Real terms Growth Rate (%)
2007-08	91.478	204	212.72	
2008-09	93.975	219	222.30	4.50
2009-10	95.389	240	240.00	7.96
2010-11	97.978	258	251.18	4.66
2011-12	100.000	272	259.46	3.29