

GENERAL GOVERNMENT CONSUMPTION AT CONSTANT PRICES

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Background

1. General government final consumption, in 2001, formed 15.8 per cent of constant price Gross Domestic Product (GDP). Latest estimates show there has been an 8.3 per cent growth in unadjusted current price government consumption between 2000/01 and 2001/02, as planned increases in spending come to fruition. The equivalent growth in constant prices has not materialised. It was 3.1 per cent over the same period. This leads to a high deflator, which has attracted the interest of the media. As an example, a headline comment in the Sunday Times was "Public Sector Inflation Out of Control".

2. General government final consumption relates to the final current expenditure of the central and local government sectors. It represents only part of total public sector spending, as it does not include capital expenditure, social security benefits or other transfers by government and also excludes expenditure by public corporations.

3. Traditionally, constant price estimates for government consumption were mainly estimated by deflating expenditure with suitable price indices. Implicitly this method assumed that there was no productivity change involved. In recent years, ONS has been introducing a methodology that directly measures the outputs produced by government and hence allows for the possibility that productivity may be changing. The UK produces its National Accounts according to international standards. In Europe these are governed, through legislation, by the European System of Accounts (ESA95). This states that direct measurement is the preferred approach to measuring constant prices and all members of the European Union are obliged to investigate the use of this method.

4. This paper explains the difference in approaches at both a basic theoretical and practical level, and then explains the impact on the government implied deflator.

Basic introduction to constant price methodology

5. At present, not all the components of government final expenditure at constant prices are obtained using the direct output method. The percentage of total coverage by each method in 2001 was as follows.

- (i) Output/direct measures: 61 per cent
- (ii) Deflation or Input method: 26 per cent
- (iii) Volume method: 13 per cent

Output method/direct measures

6. This method was first introduced in *Blue Book 1998* for health, education and social security as a first step towards compliance with the ESA95 accounting standards for government consumption at constant prices. Coverage was extended in *Blue Book 2001* reflecting further development work.

7. ESA95 states that the preferred method should measure the outputs produced by government, taking account of any changes in the quality of those

outputs. If there has been a change in productivity, this will then be reflected in the output measure. As an example, consider a productivity change which arises when more output is produced while total costs and input prices remain the same. We could expect the direct output method to accurately reflect the increased output (which would not happen with the deflation method). Any indirect benefits generated by the government expenditure, such as an increase in the health of the nation, are not considered to be outputs and are excluded.

Deflation / input method

8. For each area where it is used, this method deflates consumption expenditure by the most appropriate price indices. These are typically local government cost indices from Office of the Deputy Prime Minister (ODPM), retail price indices (RPI) and producer price indices (PPI). The selected indices are combined for each Input-Output industry and weighted according to product breakdowns for 1995. The resulting indices – by industry and economic category - are applied directly to each “chunk” of current price spending figures to form constant price values.

9. The use of price indices to deflate inputs (input method) removes price change but takes no account of productivity gains or losses. In the example in paragraph 7 above, the input method would not measure the extra output which has occurred.

Volume methodology

10. Where the constant price series are not calculated through the output method or where a suitable price index cannot be found to deflate the inputs, then a volume indicator is used. In practice, this method is only used for some wages and salaries, with numbers of employees as the volume indicator. Prior to the introduction of the output method, constant prices for all wages and salaries for central government and the police were calculated using this method.

Practical issues

11. It is acknowledged that output methodology puts forward the best theoretical approach to measuring constant prices, but, in practice, it has not proved possible to implement it as perfectly as users might like. The major shortcomings have been that, in many cases, the most appropriate indicators only become available after an appreciable delay or are not available on a quarterly basis. A further problem is that information on changes in the quality of outputs is not always available in a form which is useful for national accounting.

12. It is also important to note the differing impacts of current prices on the implied deflator in each of the three methodologies used.

Output measures – how they are calculated

13. Activity indicators are weighted together to form an index where 1995=100. Quarterly paths are generated, where necessary, using a quadratic spline function. The constant price figures follow the growth of this index independently of movements in the current price figures.

14. Coverage of the categories using output methodology and typical indicators used:

- Health: Hospital Cost Weighted Activity Index from the Department of Health (covers number and type of treatments), numbers of consultations with general practitioners, eye tests, dental treatments, prescriptions dispensed
- Education: number of pupils and a fairly basic quality adjustment to reflect examination achievements
- Social security: number of new claims processed
- Personal social services: number of adults in homes, contact hours for home helps and number of children in homes and other types of accommodation
- Legal Aid: numbers and types of cases
- Prisons: numbers and types of prisoners
- Crown Prosecution Service: numbers and types of cases
- County courts: workload: trials, summons, small claims, warrants, summons issued and administrative work
- Crown courts: committals for trial, cases for sentence, appeals
- Magistrates' and other local government courts: numbers of hearings
- Probation: workload hours
- Fire: numbers and types of fires called to, safety checks carried out, prevention talks etc

15. For the above series, little quarterly information is available and a quarterly profile is applied to the annual total using the quadratic spline function. This gives a smoother quarterly profile than is seen in the current price figures which reflects actual expenditure each quarter. It gives a slightly more erratic implied deflator than the one that would have resulted from using the input method (see below).

16. One issue affecting latest estimates is the considerable time-lag in data supply. For *Blue Book 2002*, the latest available indicators typically related to the financial year ending March 2001, although the latest Cost Weighted Activity Index for health relates to the year ending March 2000. This indicator is responsible for about 65 per cent of the output measure for health. In the absence of the desired up-to-date indicators, cruder ones are used or values are estimated, sometimes by assuming that growth rates are repeated but using other sources of information where possible. In education, for example, demographic data can be used to estimate pupil numbers. Recent analysis shows that revisions to direct measures have generally had little impact on growth.

17. Most of the indicators used are from administrative sources and believed to be of good quality as regards what they describe. Their shortcoming is in timeliness, lack of annual data and lack of perfect match with the required concept.

Volume methodology – how the calculations are done

18. The growth of the constant price figures is based on staff numbers.

19. Areas of coverage are:

- Local government police compensation of employees: police staffing numbers are used.
- Central Government Military Defence compensation of employees: staffing figures for armed forces and Ministry of Defence civil staff used.

- Remainder of Central Government compensation of employees (includes civil servants administering tax collection, Parliament, Office of the Deputy Prime Minister etc): it is impossible to identify the staffing figures in this area, so the overall trend of civil service staff figures from the Cabinet Office is used as a proxy.

20. Quarterly data are typically available 4-6 months after the period to which they relate and data are from administrative sources. The latest one or two quarters are therefore estimated, although this does not lead to large revisions.

Input method – how the calculations are done

21. For this method, a weighted index combining various price indices is divided into the current price figure. All erratic current price movements are therefore reflected also in the constant price series.

22. This method is used for any area of spending not covered by the two methods listed earlier. Examples of functions are recreational services, refuse collection, tax collection and administration, transport and roads and police and defence procurement. These are:

- Remainder of local government compensation of employees: pay indices for manuals and non-manuals used. These have a wider coverage than the remainder of local government but are a reasonable proxy.
- Remainder of local government procurement: this uses RPI and PPI indices together with indices for travel and subsistence from ODPM.
- Central government Military Defence procurement: again RPI and PPI indices with the German producer price index.
- Remainder of central government procurement: RPI and PPI indices used.
- Remainder of capital consumption for local and central government: this is produced via the ONS's Perpetual Inventory Model (PIM) which applies PPIs to current price depreciation derived from an analysis of asset lives.

23. RPI, PPI and local government indices are produced on a monthly basis less than 2 weeks after the period to which they relate. They are used in production of ONS's first quarterly estimate of GDP which is produced within two months after the latest calendar quarter. The quality of the constant price series is also dependent on the accuracy of the current price input-output breakdowns from which the weights are derived. Quality here is variable, although military defence and local government should be fairly reasonable.

24. Most revisions arising from use of this method are due to changes to the current price data. Since the introduction of output methodology, the area using the input method has shrunk and become very specific. We now need to identify detailed functional or service figures from the COFOG (Classification of the Functions of Government) data set. Revisions to functions are typically far more significant than can be seen at aggregate level. Often, a revision to one function is matched by an offsetting revision to another and the effect on current and constant price totals can appear inconsistent. For example, a downward revision to current price health, which uses the output method may be offset by an upward revision to transport which uses the input method. The revision to health has no effect on constant prices because of the method applied, the transport revision leads to an upward revision at constant prices.

25. Most indices are monthly so there are no problems with availability of quarterly information.

Current price data

26. There are possible issues concerning the quality of current price data. From 2001/02 government accounting has followed Resource Accounting and Budgeting (RAB), an accruals based approach similar to commercial accounting. Before then, departments reported expenditure on a cash basis to the Treasury, with ONS estimating accrued values by smoothing the cash data. We are unsure of how well departments have managed this change at present. Their accounts are in the process of being audited and this could generate revisions to past data. It is also possible that financial year data will be correct but the quarterly path through the year is wrongly allocated.

Impact of methodologies on the implied deflator

27. Total current price expenditure has shown strong growth since about 1999 following government policies of targeted increases in public spending, particularly for health and education. In 2001 annual growth compared to 2000 was 7.2 per cent, with the constant price equivalent having growth of 2.2 per cent. The growth in the implied deflator is therefore 4.9 per cent, which is slightly higher than the 4.4 per cent recorded for 1999 and 4.5 per cent for 2000.

28. When using the traditional methods of deflation applied before 1998, the difference in growth between current and constant prices would, by definition, have been wholly due to price changes. Since the introduction of direct measurement, the gap in effect measures both price changes and the impact of changes in productivity.

29. The following table shows a basic breakdown of the growth rates (per cent), current prices (CP), constant prices (KP) and the implied deflator for 2001 compared to 2000. Growth rates are grouped according to whether they are calculated using the output method or by using input/volume methodology. The implied deflator gives a rough indication of the increase in unit costs of production between the two years.

	CP	KP	Implied deflator	Weight
Output				
Health	10.5	3.2	7.1	0.29
Education	11.4	1.6	9.6	0.17
Social protection	4.0	2.9	1.1	0.10
Other	10.4	2.6	7.6	0.05
Input/volume				
Military Defence	-3.9	-6.9	3.3	0.14
Other CG	10.0	12.6	-2.3	0.11
Other LA	6.3	3.1	3.2	0.14
Total	7.2	2.2	4.9	1.00

30. This table shows that the biggest contributors to the high growth of the implied deflator are health and education, where output methodology applies. In the last three years, the implied deflators for health and education are always above the

level of the average implied deflator for government expenditure. They are also both areas targeted for large increases to public spending. A simplistic analysis could lead to the conclusion that, with the extra funding, productivity has actually declined.

31. If health unit costs are increasing, then overhead costs must be accounting for a higher percentage of total costs. In the health services, many activities take place which are not in themselves output but are incidental to the output. Examples are training, administration, cleaning, laboratories, security, provision of food etc. There is evidence of a higher level of recruitment and training activities (which might increase output at some future date). And there is also evidence that spending initiatives have led to higher expenditure on what we would term overheads in this context. The factors which are likely to have contributed to higher overhead spending include initiatives to raise clinical standards, better supervision for junior doctors, clinical negligence costs, the build-up of payments for PFI schemes and pay rises. On the other hand, the output measure is almost certainly understating the quality improvement: for example, the survival rate after operations has improved, but this is not reflected in the output measure from the Department of Health.

32. There is also an issue with the timeliness of the Cost Weighted Activity Index for health. The latest received relates to the year ending March 2000, with the following periods being estimated. When actual data are received, revisions may result. However analysis of comparable data up to 2001q4 indicates that there has been little change in output since 1999/2000. Therefore, the constant price values seem unlikely to be revised significantly.

33. For education, most expenditure is similarly staff related or directed specifically at the maintenance and repair of school premises. This type of expenditure does not have an impact on the measures used for constant prices (numbers of children being educated); and there is little impact on exam results in the short-term, due to education being a lengthy process continuing to the final product: an educated pupil. Data used relate to 2000/01, with population estimates used for the following periods. Although the current methodology used for the quality adjustment in education is fairly basic, other possible alternatives from OFSTED reports and exam results, show a similar flat trend. This possibly demonstrates that we are still within the period between commitment of extra expenditure and seeing the effect of this in the output of education. However, it seems unlikely that, on this basis of measurement, the output will ever catch up with the inputs.

Conclusion

34. Where output methodology is used to calculate constant prices, growth of output is significantly lower compared to the current price equivalents. This results in a high growth in the implied deflator. However, when explained in context, this lower than expected output (and reduced productivity) makes sense, particularly in the short-term, where part of the new spending is being used to produce better public services in the future.

35. Direct measurement is the theoretically superior method and the preferred approach under the ESA95 national accounting framework. Despite more practical difficulties concerning data collection, there is generally little change to growth following revisions.

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