

Methodology of the Monthly Index of Services

Public Administration and Defence, Education and Health and Social Work Industry Review

Introduction

At the launch of the experimental Index of Services (IoS) in December 2000, a commitment was made to review and improve where practical, the sources and methods used to measure the service sector. A review of these industries has already been implemented at June 2004, but further work has since been carried out. This paper outlines the further findings of the Public Administration and Defence, Education and Health and Social Work (PSD¹) Industry Review.

Summary

The industry review for PSD has recommended:

- to introduce revised PSE data
- to introduce direct employment measures of private sector output on a headcount basis rather than a derived quasi FTE basis
- to introduce improved government output indicators from the Atkinson Review
- to remove obsolete indicators for the Agricultural Intervention Board and dental practitioners
- to remove capital consumption as a short-term indicator
- to introduce MIDSS for other education

These methods will be changed back to 1996 in the IoS and GDP(O) systems. The main impact of the new methodology is stronger growth in the years since 1999, except 2001 and 2002.

How important are the Public Sector Dominated industries?

In terms of gross value added (GVA) weights in 2002, PSD industries (SIC² Divisions 75, 80 and 85) represents:

- 24.0% of the IoS
- 17.7% of Total GVA

¹ Public Sector Dominated industries

² The SIC is the Standard Industrial Classification, and this is the classification system used in the UK to define industrial groupings. The 4-digit refers to the level of detail and is generally the level at which data is collected and aggregated from within GDP(O) and IoS. More detail on this can be found in the IoS Methodology documentation

Public Administration and Defence, Education and Health and Social Work is published as part of the Government and Other Services³ component within the IoS.

Methodology

Previous methodology⁴

The full methodology for these divisions can be found in the Annex to this report

In summary the methods can be broken down as follows by division.

Table 1

Division	GVA wt % of GDP	Employment	Capital Consumption	Output	Deflated turnover
75 – PAD	5.6%	73%	10%	16%	0%
80 - Education	5.9%	2%	0%	87%	11%
85 – Health/Social work	6.2%	27%	0%	73%	0%
Total	17.6%	33%	3%	60%	4%

There are a mixture of volume methods used, covering both input methods (for employment and capital consumption) and direct output methods (indices of government output). In addition, deflated turnover is used to measure some of the marketed output in this division.

Reasons for review

There have been two main reasons for re-visiting these industries. The first has been the Atkinson Review⁵ of government output and productivity. This review has made recommendations for a number of indicators used in IoS and GDP(O), and an analysis of their impact and interaction with existing indicators was required (to avoid double counting, etc.).

The second reason has been the recent review of Public Sector Employment (PSE)⁶. The ONS has been leading a cross-government programme of work to improve public sector employment statistics in the UK. The review has been developing standard definitions as well as improving the coverage, accuracy, timeliness and frequency of PSE statistics. A revised set of employment figures were released on the 11th March. Since PSE statistics are used widely in these divisions, it was essential to review our usage of them.

³ This covers the following sections of the UK SIC: L Public Administration and Defence; Compulsory Social Security, M Education, N Health and Social Work, O Other Community, Social and Personal Service Activities, P Private Households Employing Domestic Staff and Undifferentiated Production Activities of Households for Own Use

⁴ In this report, the previous methodology refers to the methodology used prior to Blue Book 2005, and the new methodology to the methodology taken on at Blue Book 2005

⁵ This review was announced in December 2003, and was led by Sir Tony Atkinson of Nuffield College, Oxford. The final report was released in January 2005 and can be on the National Statistics website at: http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/atkinson/final_report.asp

⁶ For more information on the Public Sector Employment review please see: <http://www.statistics.gov.uk/CCI/article.asp?ID=1095>

What should we be doing?

In October 2001, Eurostat (European Union's Statistical Office) published the '[Handbook on price and volume measures in national accounts](#)'. The handbook provides guidance by product, on what price and volume methods should ideally be used (A methods), are acceptable methods (B methods) and those methods that should not be used (C methods). The handbook has been written in the context of annual data but the same rules apply to sub-annual data. Guidance in the handbook can be broadly divided into advice for individual and collective non-market services.

Individual services

For individual services, the only methods that will be able to meet the criteria for A or B methods are methods that measure output. Input methods are C methods.

Collective services

For collective services, the classification of methods is broadly the same as for individual services, with two important exceptions that are due to the difficulty in defining the output of collective services:

- input methods are B methods for collective services;
- the use of volume indicators of activity is a B method.

More detailed guidance can be found in the Handbook.

Issues faced by the industry review

The issues for this review were as follows:

- Impact of introducing revised PSE data
- Headcount versus Full Time Equivalent (FTE) as the basis for employment data
- The use of capital consumption data as output indicators
- The introduction of new government output indicators from the Atkinson Review
- The introduction of MIDSS to replace the VAT series for adult education

Public Sector Employment changes

IoS and GDP(O) use PSE data in two ways:

- to derive input-based volume measures of output for parts of Public Administration and Defence (Div 75)
- in conjunction with total workforce jobs to derive private sector output indicators for education (Div 80) and health and social work (Div 85)

Source of revisions to PSE data

The revisions come mainly from improved coverage of employment counts by including non-departmental government bodies and other organisations classified to central government that were previously excluded. The Cabinet Office data previously used was not sectorised according to national accounts classifications⁷. The revised dataset also covers UK rather than just GB.

Impact on Public Sector output indicators

Whilst the PSE review has made revisions to the levels of Public Sector Employment, revisions to growth are minimal in most cases. The most notable change has been the introduction of a new public administration series to replace the previously used CG and LA employees series, and is now available on a quarterly basis as opposed to six-monthly.

Impact on private sector output indicators

In the previous methodology, PSE series also play a part in deriving private sector employees figures in divisions 80 and 85. The Workforce Jobs series that are published by ONS are derived by combining private sector figures from ONS surveys with public sector data. These employment series are benchmarked to the ABI periodically.

As the total workforce data is on a headcount basis only, IoS/GDP(O) previously took the total headcount figure and converted it to a FTE basis by using fixed assumptions for part-time workers. The public sector FTE data was then subtracted to derive a private sector series. This was obviously a long-winded approach (although reflecting previous data availability), and the review has recommended using the private sector data straight from the ONS survey on a headcount basis.

Recommendations

- 1. Adopt the new PSE data for indicators affected in division 75 by splicing FTE data onto headcount data from 1999 onwards**
- 2. Adopt direct private sector employment data for the private sector employment indicators in divisions 80 and 85**

FTE v headcount

In the context of measuring output, it is conceptually better to use a FTE measure of the workforce. The new PSE data is available quarterly on a FTE and a headcount basis back to 1999 Q1, and on an headcount basis only back annually to 1991. Since FTE is preferred, the new data set will be spliced onto interpolated headcount data at Q1 1999. However, for private sector the data is only collected on a headcount basis.

⁷ Please see the following article for a guide to the institutional sectors of national accounts:
<http://www.statistics.gov.uk/CCI/article.asp?ID=154>

Recommendation

3. Recommendation: Use PSE data on a FTE basis and private sector on a headcount basis

Other changes

Whilst analysing the impact of Atkinson proposals on the IoS/GDP(O) a couple of issues were identified. These are as follows.

Rural Payments Agency

A Cost Weighted Activity Index for this government agency was introduced when it was called the Agricultural Intervention Board, in 2001. However, since changing to the Rural Payments Agency, the data source has since been discontinued. Its weight at Blue Book 2004 was 0.06 ppt⁸, and will be dropped from the methodology.

Dental practitioners indicator

The previous methodology for health includes an output indicator for public sector health, which includes a component for NHS dental care; a private sector employment indicator which includes dentists; and a separate indicator measuring the number of dental practitioners registered. Since dentists are being included within the private sector employment series as well the dental practitioners proxy is effectively obsolete. The series also has a small weight and is based on interpolated annual data. This indicator has also been dropped from the methodology.

Recommendation

4. Remove Rural Payments Agency and Dental practitioners indicators

Use of capital consumption as output indicators

In most cases where employment indicators are used to measure public sector output, capital consumption is also used. This is on the basis that GVA for a non-market producer is made up of compensation of employees and capital consumption. Hence, instead of measuring output directly, we are attempting to measure the components of GVA.

The problem with this approach is that the capital consumption data is not available on a short-term basis and is estimated using a Perpetual Inventory Model (PIM). This is an economic model, which enables balance sheets (or stocks) to be calculated from the associated flows. The PIM takes capital investment data (from Gross Fixed Capital Formation) and uses it to form estimates of the value of capital stock. Assumptions about the life of these capital stocks are used to ensure that they are withdrawn from the model when they are no longer economically useful.

⁸ Parts per thousand of GDP by GVA weight

The review found that this data source is difficult to justify as a short-term output indicator and will be dropped from the methodology. This means that the weights for capital consumption will be added to the relevant employment indicator.

Recommendation

5. Remove the capital consumption indicators where used in IoS/GDP(O)

Other divisions using employment

It should be noted that the changes to PSE are not limited to divisions 75-85. PSE data is also used in divisions 90 (sewage and waste disposal) and 92 (recreation). These changes are only minor as they affect a small proportion of each division⁹. These changes have only been introduced for the open period (back to 2002). In addition, the capital consumption indicators will also be dropped as indicated above.

Recommendation

6. Introduce new PSE data for the open period for divisions 90 and 92 and remove the relevant capital consumption indicators

Atkinson Review changes

Further improvements to the methodology used to measure output of public services were published on 24 May 2005.¹⁰ These improvements stemmed from work done during and after the Atkinson Review and essentially represented incremental changes to the existing methodology.

Those outputs affected were Health, Education, Personal Social Services (adult and children's social services), Administration of Social Security and Fire Services. The improvements included:

- Health: More comprehensive data including an increase in the number of treatment categories covered for England, from 1,732 to 1,929; and inclusion of data for Northern Ireland.
- Education: Pupil attendance, conceptually a better measure, replaced pupil registration
- Personal Social Services: Includes a wider and more detailed coverage of output activities for adults.
- Administration of Social Security: The old measure was of output which represented less than 50 per cent of spending. The new measure covers over 90 per cent.
- Fire Services: More detailed data on the most serious fires.

More detail of the improvements and their impact can be found in the following two articles:

⁹ For division 90, employment indicators represent 1.0 ppt and 16% of the division. For division 92, 1.2 ppt and 5% of the division.

¹⁰ <http://www.statistics.gov.uk/cci/article.asp?id=1144>

'Improvements in the methodology for measuring government output'¹⁰ and, 'Improvements to the national accounts measure of output of adult social services'¹¹. This article sets out the significant changes made to the measurement of output of Adult Personal Social Services.

MIDSS for other education

At the last Blue Book, VAT turnover was introduced for other education. At the same time, the collection of MIDSS turnover data for this industry was also started. From Blue Book 2005, the MIDSS turnover series will be used, spliced onto the VAT series.

Recommendation

7. Introduce the MIDSS turnover series for other education

Who was consulted as part of the Industry Review process?

Within the ONS, there was comprehensive consultation with relevant teams both within National Accounts, Atkinson Review team and in the Employment survey areas.

New methodology

In summary the PSD industry review has made the following recommendations that were implemented at Blue Book 2005:

- to introduce revised PSE data
- to introduce direct employment measures of private sector output on a headcount basis rather than a derived quasi FTE basis
- to introduce improved government output indicators from the Atkinson Review
- to remove obsolete indicators for the Agricultural Intervention Board and dental practitioners
- to remove capital consumption as a short-term indicator
- to introduce MIDSS for other education

Benefits and assumptions of new methodology

Benefits	V	Assumptions
Improved coverage, frequency and timeliness of PSE data		Where employment is used, the assumption is that the volume of output follows the volume of inputs.
Private sector employment data is now a direct measure rather than a derived series		For the private sector employment assuming that the headcount basis moves in the same way as FTE
Indicators are more relevant to short-term changes in output		
Improved coverage of government output indicators		
No longer relying on a fixed assumption for private sector FTE series		

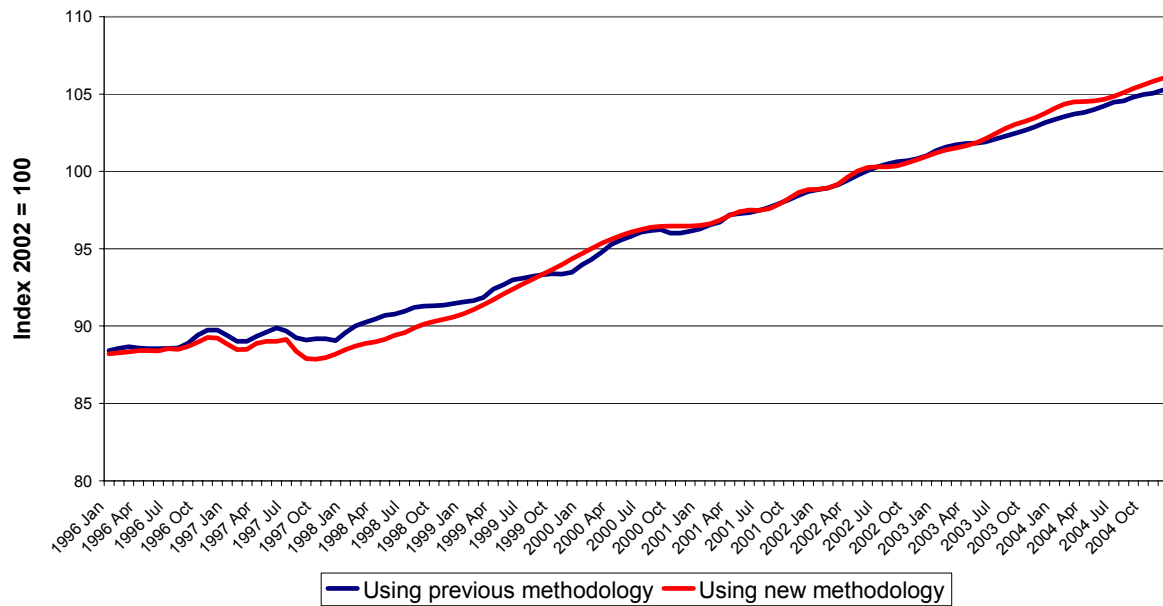
¹¹ See <http://www.statistics.gov.uk/cci/article.asp?id=1145>

Impact of new methodology

The graph below shows the impact of the new methodology for the PSD divisions. The data has been revised back to January 1996. This in line with the closed period for revisions set-out in the National Accounts Revisions Policy for Blue Book 2005.

Figure 1

Public Sector Dominated industries (SIC 2003 Divisions 75, 80 & 85) chained volume measures seasonally adjusted



Contact Information

Any questions or comments on this article are welcome, as are offers to participate in the process of improving industry sources and methods. Any enquiries should be addressed to:

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Annex – Summary of changes for Blue Book 2005 – Divisions 75, 80 and 85

Division	SIC	Title	GVA wt	CURRENT					NEW			
				Description	Source	HC/FTE	UK/GB	Adj'mts	Description	HC/FTE	UK/GB	Adj'mts
Division 75 – Public Administration and Defence	75.11	National gov't	15.9	CG: Civil Service Employment: broken down by industrial/non-industrial staff	Cabinet Office	FTE	GB	Adj. for grade drift	PSE: Public administration	FTE	UK	Adj. for CG grade drift (updated)
			1.4	CG: Non-trading capital consumption	ONS	n/a	n/a	n/a				
			3.8	Index of output for social security	DWP	n/a	n/a	n/a				
	75.12		4.1	NHS Admin: Admin / clerical staff in Health Authorities	DoH	FTE	GB	None	No change	n/a	n/a	n/a
			0.1	Rural payments agency – Index of output	RPA	n/a	n/a	n/a	Removed			
	75.20	Local gov't	6.1	LA employees in services nec	ONS	FTE	GB	Adj. for grade drift	PSE: Public administration	FTE	UK	Adj. for CG grade drift (updated)
			4.2	LA: Non-trading capital consumption	ONS	n/a	n/a	n/a				
	75.22	Defence	6.4	HM Forces staff	DASA	FTE	UK	None	PSE: HM Forces	FTE	UK	None
	75.23	Justice	2.9	Index of output for justice services	HO	n/a	n/a	n/a	No change	n/a	n/a	n/a
	75.24	Police	8.9	Numbers of police and civilians by rank for Eng, Wal, Scot, NI.	HO	Headcount	UK	None	Police and civilian staff	FTE	UK	None
75.25	Fire services	2.5	Fire Service index of output	ODPM	n/a	n/a	n/a	Improved index of output	n/a	n/a	n/a	
Education	80.00	Primary, Secondary & HE activities	41.1	Index of output for public sector and NPISH	DfES	n/a	n/a	n/a	Improved index of output	n/a	n/a	n/a
			1.2	Non-LA employees	ONS	FTE	GB	Productivity adj.	ONS: Private sector employees	Headcount	GB	Productivity adj.
			9.8	Number of day and boarding pupils at UK private schools	ISCIS	n/a	n/a	n/a	No change	n/a	n/a	n/a
	80.40	Adult / other education	6.6	Deflated turnover from VAT returns	HMCE	n/a	n/a	n/a	No change	n/a	n/a	n/a
Health and social work	85.10	Human health and vets	36.4	Index of output for public sector and NPISH	DoH	n/a	n/a	n/a	Improved index of output	n/a	n/a	n/a
			0.3	No of general dental practitioners	NHS	FTE	GB	n/a	ONS: Private sector employees	Headcount	GB	Productivity adj.
			7.7	Non-NHS medical services staff numbers	ONS	FTE	GB	Productivity adj.				
	85.30	Social work	8.6	Non-LA employees in social services	ONS	FTE	GB	Productivity adj.	ONS: Employees	Headcount	GB	Productivity adj.
			0.2	LA: Non-trading capital consumption	ONS	n/a	n/a	n/a				
			8.0	Probation service output	HO	n/a	n/a	n/a	No change	n/a	n/a	n/a
			0.5	LA Personal Social services output	DWP	n/a	n/a	n/a	Improved index of output	n/a	n/a	n/a

Key: CG – Central Government, DASA – Defence Analytical Services Agency, DfES – Department for Education and Skills, DoH – Department of Health, DWP – Department for Work and Pensions, FTE – Full Time Equivalent, HE – Higher education, ISCIS – Independent Schools Council Information Service, LA – Local Authority, NHS - National Health Service, NPISH – Non Profit Institutions Serving Households, PSE – Public Sector Employment, RPA – Rural Payments Agency

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