Methodology of the Monthly Index of Services

Computer Services 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. Computer Services is one of the second set of industries as part of the IoS Industry Review Programme. This paper outlines the findings of the Computer Services Industry Review.

Summary

This industry review recommended no changes at present to the current data sources and methods currently used by IoS and GDP(O)[1] to measure computer services. However, the review did recommend that the Corporate Service Price Index (CSPI) for computer software should be introduced once it is available and has been through the IoS/GDP(O) quality assurance process. Although it is envisaged that the series would not cover all the products/services provided by the division, it would be recognised as a conceptual improvement over the current method of deflation.

How important is Computer Services?

In terms of gross value added (GVA) weights for 2000, computer services (SIC[2] Division 72) represents:

- 3.6% of the Index of Services
- 2.6% of Total GVA

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[1] GDP(O) is the output measure of Gross Domestic Product

[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

Methodology

Current methodology

Owing to the fact that the methodology has been left unchanged, unlike other industry review reports there is no previous methodology section. Within computer services there are 6 4-digit SICs covering the following:

Table 1

SIC	Description	GVA parts per 1000	Weight in Div 72
72.10	Hardware consultancy	9.0	35%
72.30	Data processing		
72.40	Database activities		
72.60	Other computer related activities		
72.20	Software consultancy and supply	16.0	63%
72.50	Maintenance and repair of office, accounting and computing machinery	0.7	2%

For the purposes of GDP(O) and IoS, 72.1, 72.3, 72.4 and 72.6 have been grouped together. The data is provided and analysed at this level of aggregation. The reason for grouping the four components as shown in the above table, was due to the fact that individually their weights were small.

Currently the proxy used to measure the GVA of the computer services sector is the monthly turnover data provided by ONS's Monthly Inquiry into the Distribution and Services Sector. This turnover series is deflated by the average earnings index (AEI) for business services combined with the general retail price index (RPI) excluding mortgage payments and indirect taxes (known as RPIY).

Reasons for review

The main reasons for reviewing computer services are:

- Computer services is a rapidly changing and growing industry
- The Servcom pilot survey[3] carried out for the year 2000 for computer services noted that the SIC structure is out-of-date
- The turnover data that is currently used within the output measurement is subject to volatility and revisions after the first month of publishing
- Owing to the historical lack of service price statistics, the current method of deflation is the best available option, however:
  - the average earnings index is a general series covering divisions 70-74, this measures inputs to the industry and is not specific to computer services
  - the RPIY is not an appropriate deflator, nor is this deflator specific to the industry
  - recent re-development of the CSPI for computer services has meant that a price index for computer services should be available in the near future
- Key users have stressed the importance of reviewing computer services as they regard this as a key growth area in the economy

[3] The Servcom pilot study was a one-survey carried out in 2001. Its aim was to assess the feasibility of conducting a Prodcom survey in the service sector. The sector piloted was computer services. See Prestwood D (2001) for more information.

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), 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.

The preferred (A) method is to use turnover deflated by appropriate quality adjusted PPI (in the UK this would translate to a CSPI combined if necessary with the RPI where household consumption exists). Acceptable B methods, are to use less appropriate PPIs, as well as using the US PPI for pre-packaged software.

Issues faced by the industry review

Quality of turnover data

One of the main issues for this review has been the quality of the turnover data used as the proxy indicator for computer services. In order to assess this issue, the data has been looked at from a conceptual aspect and then from looking at the data quality (in terms of volatility and coherence with other data sources).

Conceptual quality

As well as the MIDSS data that are collected by the ONS, there is also the option of using VAT turnover data from HM Customs & Excise. The following two tables summarise the benefits and issues of using the two data sources from a conceptual standpoint.

Table 2

VAT Benefits		VAT Issues
Data represent a virtual census of the business population, except those under the VAT threshold.		Latest month's estimate based on a forecast as the data is not available in time (VAT data is only usable after 9 wks)
Data are free of charge. Compliance is mandatory so no additional burden on business from ONS use of the data.		No briefing is provided with the VAT data
	V	Data are only part-monthly, coming from a combination of monthly and quarterly contributors
		Estimation relies on the regularity of response rates at each delivery.
		There is no control over the data source
		VAT does not cover those businesses not registered for VAT (14% of all companies)
		The turnover definition used by HMCE is not consistent with the MIDSS definition

MIDSS Benefits		MIDSS Issues
Latest month's estimate based on real data, not a forecast.	**V**	Sample sizes for smaller businesses are relatively small, but large businesses are fully enumerated.
Data are monthly		Ratio estimation and rotational sampling tend to cause high levels of volatility in the data (although rotation adjustments partly address this)[4]
Good briefing information available.		MIDSS for division 55 are collected inclusive of VAT, whereas all other MIDSS are collected excluding VAT.
MIDSS are an ONS data source – hence there is control over the data source		
MIDSS are sampled from the IDBR, which has a higher quality of industrial classification		
Data is available after 5 weeks		
MIDSS covers all businesses classified to an SIC (i.e. non-VAT registered)		

Data quality

In reviewing the data quality of the MIDSS data, the following areas were looked at:
1. sample attributes
2. response rates and revisions history
3. comparisons with VAT data

Sample attributes

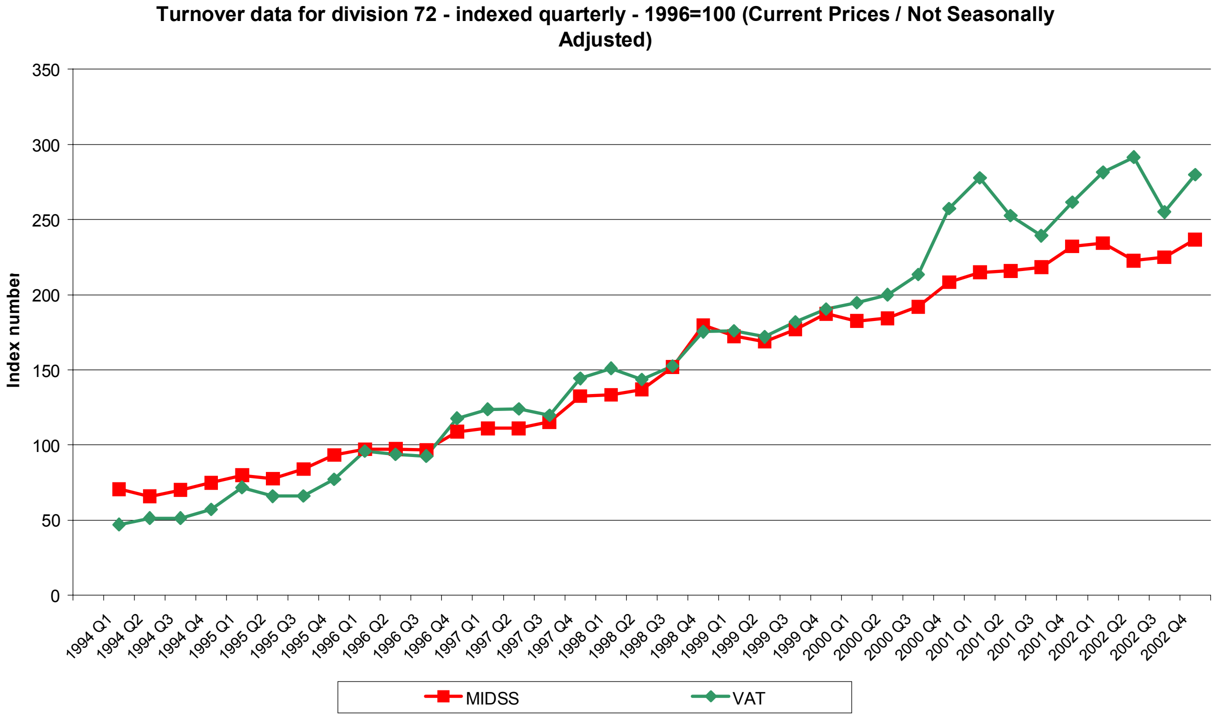
The sample within the MIDSS survey is allocated on the basis of a Neyman allocation. This uses value added ratios to ensure that industries with high turnover / low margins (such as wholesale) are not disproportionately sampled. Following the last review of the sample allocation in September 2001, the sample size for computer services increased from 1500 to 2700 contributors.

Comparison of MIDSS data with VAT

It is useful to compare MIDSS against the VAT turnover data to see how they compare over the longer term. For the comparisons, we have used the VAT data with the MIDSS series. The analysis has been conducted using 1996 as the base year, as the VAT data is only a consistent time series from this point (due to the re-classification of VAT data to SIC(92)).

[4] See IoS Methodology for more details on quality adjustments - http://www.statistics.gov.uk/iosmethodology/quality_assurance.asp

Figure 1



The graph above shows that up until mid 1999, the VAT was broadly consistent with the MIDSS data, but since then, the VAT series has shown stronger growth. In considering the results, MIDSS were deemed to be a more reliable estimate of short-term growth, this has been backed-up by the following points:

- VAT data are not subject to validation checks by compilers
- Briefing is not supplied with VAT data (i.e. explanations of movements, etc.) – briefing is an essential part of the quality assurance process
- VAT data is less timely than MIDSS (available after 9 weeks) and is subject to interpolation to derive a monthly path from (as VAT data is returned either monthly, staggered quarterly or annually)
- MIDSS have better coverage as not all companies are registered for VAT in this division, and the better quality classification of the register compared with VAT

<u>Deflation</u>

Up to Blue Book 2003, the deflator used for computer services has been a composite of deflator of the AEI for business services generally (SIC 70-74 / Section K) and the RPIY weighted together equally. This deflator is neither specific to the industry nor appropriate, as it does not relate to the outputs of the industry, it has however been used, as it was the best available deflator available.

The reason why the AEI deflator for divisions 70-74 is used is because it is only at this level at which the quality is publishable[5]. In reviewing the options that are available, it was concluded that at present there are only two possible deflators that would be considered as conceptual improvements[6], these are the:

- US PPI for pre-packaged software
- CSPI for computer software

US PPI for pre-packaged software

According to the Eurostat handbook the US PPI for pre-packaged software[7] is permissible as an accepted B method of deflation for computer services. This index has been published since the beginning of 1998 covers the following items:

- Applications software
- Applications software sold separately (non-suite)
- Applications software sold as a suite
- Computer games and other pre-packaged software
- Maintenance, documentation, training and other software services

The question is whether or not a US PPI is suitable for deflating computer services in the UK. The main issue is that development of pre-packaged software in the US is much greater than it is in the UK (only 6% by turnover according to Servcom). The software that is developed in the US is only distributed in the UK (through retailers and wholesalers), hence the software that is developed and pre-packaged in the US does not match the software that is developed and pre-packaged in the UK.

The review has found that using this series as a proxy for the whole of UK computer services would not be advisable as the US products do not match the UK products. They cover only a small proportion of the UK market and the price index reflects what is happening in the US economy not the UK (mainly through wage rates). There would also be issues around adjusting for exchange rates, although this is common with other output indicators already used within the IoS and GDP(O) in finance.

CSPI for computer software

The CSPI for computer software is currently undergoing re-development and is not yet published as part of the experimental CSPI release. An index for computer services was originally suspended in 1999 due to the fact that the index was no longer representative of the industry. Since this time, the series has undergone a data proving exercise extracting viable items in order to construct a series just for computer software. The sample was also boosted in July 2002.

[5] An AEI article has classified the AEI industry series into quality bands, based upon standard error of the growth rate as a proportion of the estimated growth rate. – See Youll (2002)

[6] This is according to the Eurostat Handbook on Price and Volume (2001)

[7] More information on US PPIs generally can be found at http://www.bls.gov/ppi/home.htm – a specific article on the re-issue of the pre-packaged software index can be found at http://www.bls.gov/ppi/ppi7372.htm

Previously the CSPI attempted to cover the whole of computer services, whereas the re-development has concentrated on developing the components of division 72 in stages. The work has built upon the results of the Servcom survey that was carried out in 2001. Due to the SIC dis-aggregations for division 72 being out-of-date, Servcom developed a new classification of products in conjunction with industry and other government department's. The current re-development of the CSPI is on the basis of the new classification.

Once the CSPI has been fully re-developed and is ready for publishing, GDP(O) and IoS will assess the quality against acceptance criteria that have been set-out. It has been agreed in principle that GDP(O) and IoS should introduce this CSPI even though the price index will only cover part of the computer services industry (25% by turnover according to the results of the Servcom survey). This can be justified as the deflator would be conceptually better as it is specific to the industry and is measuring the outputs of the industry.

Conclusion

Since the CSPI for computer software is not yet published, GDP(O) and IoS will continue to use the existing deflator.

SIC Structure

Servcom study

One of the main problems with computer services is the actual SIC structure. The Servcom pilot showed that the existing SIC structure is out-of-date and one of the main outcomes of that project was an updated product classification. This basically divides the computer services industry into three categories:

1. Products - covering development of applications, tools and software systems
2. People - consultancy, systems development, application management
3. Operations - outsourcing, data centre/server farm management, bureau processing, web hosting, etc.

This revised classification means that there is no direct product-to-industry link, and since CSPI are re-developing computer services using the Servcom classifications, this means that the future CSPI series will be developed on a different classification system than that currently used by the GDP(O) and IoS.

With only a general deflator being used at present, this is not an issue at the moment, but future price developments could cause problems in referring the products back to the industry classifications. However, as part of the project a conversion matrix was developed in order to fulfil a commitment to provide compatible data to the Eurostat Business Services project, therefore if this problem did arise a solution would be on hand.

Operation 2002 and 2007

At the beginning of 2003, a minor revision to the UK SIC was introduced[8]. The only change made to computer services was for 72.20 Software consultancy and supply to be split into 72.21 Software publishing and 72.22 Other software consultancy and supply. Since this is below the 4-digit level this will not impact on the way that the data is used within the IoS/GDP(O).

Operation 2007 is however going to be a major revision to the SIC system. Consultation is currently taking place as to the nature of the changes, but it is likely that there will be a greater breakdown of the service sector. However, until such future changes are agreed, there is no point in changing the current groupings in anticipation of future changes.

Who was consulted as part of the Industry Review process?

Within the ONS, there was comprehensive consultation with relevant teams both within National Accounts and in the survey areas. In terms of external consultations, the review was able to learn from the many consultations that took place in the Servcom study, although the review did consult with IBM, Eurostat and the Department of Trade and Industry.

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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References

Jones G (2003). Economic statistics and the Standard Industrial Classification 2003, Economic Trends, vol No. 593, pp 21-28. Available for download from:
http://www.statistics.gov.uk/articles/economic_trends/ETApr03Jones.pdf

[8] For more information on Operation 2002 please see http://www.statistics.gov.uk/sic2003

Pike R and Reed G (2000). Introducing the Experimental Monthly Index of Services. Economic Trends, No. 565, pp 51–68, ISSN: 0013 0400. Available for download from http://www.statistics.gov.uk/articles/economic_trends/Experimental_Monthly_IoS_Aug_2000.pdf

Pike R and Drew S (2002). Experimental Monthly Index of Services. Economic Trends, No. 583, pp 70–78, ISSN: 0013 0400. Available for download from http://www.statistics.gov.uk/articles/economic_trends/ET_June02_Rob_Pike.pdf

Drew S and Morgan D (2003). Experimental monthly index of services – An update. Economic Trends, No. 599. Available for download from http://www.statistics.gov.uk/ios

Prestwood D (2001). Computer Services Survey (SERVCOM Feasibility Study) Data for 2000, Economic Trends, no 574, pp 41-47. ISSN: 0013 0400. Available for download from: http://www.statistics.gov.uk/articles/economic_trends/Computer_services_survey.pdf

Sharp P (2003), GDP: Output approach methodological guide – Revised. National Statistics Methodology Series No. 32. ISBN 1 85774 537 X. Available for download from: http://www.statistics.gov.uk/downloads/theme_other/GSSMethodology_No_32.pdf

Tuke A and Reed G (2001). The effects of annual chain-linking on the output measure of GDP, Economic Trends, No 575, pp 37-53, ISSN: 0013 0400. Available for download from http://www.statistics.gov.uk/articles/economic_trends/chainlinking.pdf

Youll R 2002. Quality of the estimates of earnings growth from the Average Earnings Index, Labour Market Trends, vol 110, no 4, ISSN: 1361-4819. Available for download from: http://www.statistics.gov.uk/articles/labour_market_trends/AEI_estimates_apr2002.pdf

Eurostat (2001). Handbook on price and volume measures in national accounts, ISBN 92 894 2000 6. Available for download from: http://europa.eu.int/comm/eurostat/Public/datashop/print-catalogue/EN?catalogue=Eurostat&product=KS-41-01-543-__-N-EN

Office for National Statistics (2002). IoS Documentation. Available for download from: http://www.statistics.gov.uk/iosmethodology

US Department of Labour, Bureau of Labour Statistics – for more information on US PPIs see – http://www.bls.gov/ppi/home.htm