Impact of Rebasing the Services Producer Price Index to 2010=100

Author Name(s): John Jeremy and Robert Bucknall, Office for National Statistics

Abstract

This article describes the effect of rebasing the Services Producer Price Index (SPPI) onto a 2010=100 base year and summarises the impact that rebasing has had on the headline Gross Sector Output (GSO) series. Differences between the previous (2005) and new (2010) base year weighting patterns are illustrated in the Gross Sector series. Differences in index values and growth are also illustrated and discussed.

Introduction

The SPPI captures quarterly changes in the price received for services provided by UK businesses to other UK businesses and Government. Individual SPPIs are available which provide information on price change for a selection of service industries and these individual indices are also aggregated together to create an aggregate SPPI with limited coverage. The SPPI has been rebased onto a 2010=100 basis and was published on 26 February 2014. Rebasing is the process of updating the reference period and the weighting patterns of indices within the index framework. Over time the relative volumes of service commodities consumed and prices charged for them changes. The SPPI has updated weights to reflect changes in the patterns of purchases in the services sector between 2005 and 2010. Updating to a more recent weighting pattern ensures that the SPPI is more reflective of the current structure of the economy and the relative size of industries within the services sector.

The index weights are calculated using sales data from a number of sources, including the Services Turnover Survey (STS), the Annual Business Survey (ABS) and National Accounts Supply and Use tables. Weights for the aggregate level SPPI are calculated on both a Gross and Net Sector basis. The sales used to weight the GSO index include all business to business transactions regardless of the sector they occupy. The sales used to weight the NSO index exclude sales to businesses within the services sector.

GSO Weights - For most industries, sales from the Services Turnover Survey (STS) were used to determine their weight into the aggregate SPPI. Where STS data was unavailable, ABS was used as a proxy. In order to make the ABS data more comparable to the STS data an adjustment factor was applied to remove sales attributed to non-service provision. These sales values were then used to calculate the industry weights.
NSO Weights - Net Sector weights were calculated by taking the Gross Sector sales data and adjusting them to represent only sales to businesses outside the service sector. This adjustment was made using data from the National Accounts Supply and Use Tables. These tables allow for the calculation of a ratio for each industry that approximates the proportion of sales to non-service sector businesses. This ratio was applied to the Gross Sector sales to give an approximation of the Net Sector sales. The resulting calculated sales were then used to weight the industries into the Net Sector aggregate SPPI.

Rebasing the SPPI does not mean that the whole series has been reweighted using the 2010 weights. Doing so would have caused inappropriate weights to be applied to earlier periods. To avoid this, a year between the old and new weighting patterns was selected. A period within the selected year was then chosen as the link period. In the case of 2010=100 rebasing, the link period is 2008 Q4. For the periods before the link period the indices were re-referenced to 2010=100. From the link period onwards the indices were aggregated using the new weighting pattern. This means that for periods up to the link period there is no change in growth rates, but growth rates after the link period could be revised due to the effect of rebasing.

Prior to the 2010=100 rebasing, the aggregate level SPPI was calculated as the weighted average of the industry level index values. In order to ensure the aggregate SPPI is as representative of the whole service sector as possible, a new index structure has been introduced using the component indices available. This structure follows the Standard Industrial Classification (SIC) 2007 codes where possible and aggregates industries into appropriate divisions. These divisions aggregate into sections and it is these sections that are then combined to form the aggregate SPPI. The use of this index structure ensures that the sales from industries for which indices are not currently published are represented in the weighting structure. This means that more of the service sector is represented than in the previous structure. It should be noted that the structure that has been implemented for the 2010=100 rebasing still does not reflect the whole service sector. Work is ongoing which aims to produce the full structure for a future rebasing.

Effect of rebasing on Gross Sector Output (GSO)

Updating the base year and the sales used to calculate weights has led to changes in GSO weights, as shown in Table 1 and Figure 1.
Table 1: Comparison of GSO 2005=100 and 2010=100 weights

<table>
<thead>
<tr>
<th>Description</th>
<th>2005 Index Weight (%)</th>
<th>2010 Index Weight (%)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles</td>
<td>2.6</td>
<td>3.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Water Supply; Sewerage, Waste Management and Remediation Activities</td>
<td>3.4</td>
<td>1.6</td>
<td>-1.8</td>
</tr>
<tr>
<td>Transportation and Storage</td>
<td>20.2</td>
<td>19.2</td>
<td>-1.0</td>
</tr>
<tr>
<td>Real Estate Activities</td>
<td>9.2</td>
<td>5.2</td>
<td>-4.0</td>
</tr>
<tr>
<td>Professional, Scientific and Technical Activities</td>
<td>22.6</td>
<td>27.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Other Personal Service Activities</td>
<td>0.9</td>
<td>0.3</td>
<td>-0.6</td>
</tr>
<tr>
<td>Information and Communication</td>
<td>17.1</td>
<td>20.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Education</td>
<td>3.7</td>
<td>1.5</td>
<td>-2.3</td>
</tr>
<tr>
<td>Administration and Support Services</td>
<td>18.2</td>
<td>15.5</td>
<td>-2.8</td>
</tr>
<tr>
<td>Accommodation and Food Service Activities</td>
<td>2.1</td>
<td>5.3</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Table source: Office for National Statistics

Download table

[XLS](XLS format) (17.5 Kb)
The largest changes in weight occur in 'Information & Communication', 'Professional, Scientific & Technical Activities' and 'Real Estate Activities'. As well as relative changes in sales between sections, the methodology used to calculate the index weights has also been improved since the 2005=100 rebasing. This change to the methodology can make comparisons between the 2005 and 2010 sales difficult, as they are not necessarily comparable.

The increase in the weight of the 'Information & Communication' section is largely due to an increase in sales in the 'Business Telecommunications' and 'Computer Services' industries relative to other sections.

The increase in the weight of the 'Professional, Scientific & Technical Activities' section is due to a combination of both increased sales in the established industry level indices and the expanded coverage of the section due to the introduction of newly developed indices. This expansion in coverage has also brought an increase in sales allocated to this section, hence increasing the section's weight in comparison to other sections.
The decrease in the weight of the 'Real Estate Activities' section is largely due to the change in methodology. In the 2005=100 rebasing an estimate for business to business services was calculated. The 2010=100 rebasing used business to business sales collected directly from respondents. This allowed for a more accurate measure of business to business sales, which produced a significantly lower sales figure in the 2010=100 rebasing than in the 2005=100 rebasing.

The impact of the weight changes on index values is illustrated in Figure 2. Index values for the 2005=100 and 2010=100 series are plotted from the link period (2008 Q4) onwards. To aid comparison the 2005=100 series has been rescaled so that index values average 100 across 2010.

**Figure 2: Comparison of SPPI GSO 2005=100 and 2010=100 index values**

United Kingdom

![Index Value Chart](chart.png)

Source: Services Producer Price Index (SPPI) - Office for National Statistics

**Download chart**

[XLS](XLS format) (27 Kb)
Figure 2 illustrates that the 2010=100 series follows a similar trend to the 2005=100 series, although growth in the 2010=100 series is at a slower rate. Between 2008 Q4 and 2013 Q3 GSO prices are now estimated to have grown by 3.2% (i.e. 99.8 to 103.0) as opposed to the 5.6% (i.e. 109.6 to 115.7) that was estimated using 2005 weights.

Figure 3 illustrates that quarter on quarter growth in the 2010=100 series is consistently lower than quarter on quarter growth in the 2005=100 series between 2009 Q1 and 2011 Q1.

**Figure 3: Comparison of SPPI 2005=100 and 2010=100 quarterly movements**

United Kingdom

Source: Services Producer Price Index (SPPI) - Office for National Statistics

**Download chart**

XLS format (18 Kb)

The two component sections which have largest impact on the difference in GSO growth between 2005=100 and 2010=100 are 'Water supply, Sewerage & Waste management' and 'Information & Communication'. Figure 4 compares index values of the 2005=100 and 2010=100 GSO series against these two component indices.
The index for 'Water supply, Sewerage & Waste management' exhibits the highest growth of all component sections of GSO (2010=100). Between 2008 Q4 and 2011 Q1 prices increased by 15.4% (i.e. 89.9 to 103.3). The weight of this section within GSO fell from 3.4% to 1.6% during 2010=100 rebasing, resulting in this component section having the largest contribution in slowing the growth of the headline GSO SPPI.

The index for 'Information & Communication' fell by 5.3% (102.9 to 97.4) between 2008 Q4 and 2011 Q1. The weight of this section within GSO increased from 17.1% to 20.8% during 2010=100 rebasing. The combination of the fall in price and large increase in weight resulted in this component section having a large contribution in slowing the growth of the headline GSO SPPI.
Conclusions

- Improvements have been made to the weighting methodology, resulting in the use of more representative measures of business to business sales in the calculation of weights.
- A new index structure has been introduced which ensures that the sales from industries for which indices are not currently published are included in the weighting structure. This means that more of service sector is represented than in the previous structure.
- Differences between 2005=100 and 2010=100 index series are small in the aggregate SPPI with larger differences occurring at the more detailed industry level.
- Changes within GSO are mainly attributable to the 'Water supply, Sewerage & Waste management' and 'Information & Communication' sections.

Background notes

2. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.

Copyright

© Crown copyright 2014

You may use or re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/ or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

This document is also available on our website at www.ons.gov.uk.

SPPI Background

The SPPI measures the change in prices of services provided to UK businesses and government by UK service providers. There are two aggregate SPPI measures produced:

- Gross Sector Output (GSO)
- Net Sector Output (NSO)

The differences between gross and net sector are:
• Gross sector – All transactions are included when deriving the weights, including sales to businesses within the service sector.

• Net sector – The weights used to calculate this index excludes transactions between businesses classified to the same sector. In the case of the SPPI this means that only sales to businesses outside of the service sector are used in the calculation of the weights.

The same basic price information is used to feed into each of the aggregate SPPI series. The difference between the two lies in the weights that are applied to combine the section-level series to form the aggregate level indices. The headline series produced in the SPPI Statistical Bulletin is the GSO.

Price data

Around 5,200 price quotes are collected each quarter, together with some prices from administrative sources such as industry regulators and other government departments.

The SPPI is a Laspeyres type index with fixed weights updated every five years. A Laspeyres price index calculates the change in value of a selection of \( n \) items assuming that the quantities of each item purchased are the same as they were in the based period.

This is defined as:

\[
\text{Laspeyres Index} = \frac{\sum_{i=1}^{n} p_t q_{0i}}{\sum_{i=1}^{n} p_0 q_{0i}}
\]

Laspeyres Index formula

where \( p_t \) is the price of commodity \( i \) at time \( t \), \( p_0i \) is the price of commodity \( i \) in the base period \( 0 \) and \( q_0i \) is the quantity of commodity \( i \) purchased in the base period \( 0 \).

Each SPPI series is structured in the same way. Initially, the prices supplied by each contributor are compared with the average price of the same item in the base period, to form a price relative. The price relatives are then weighted together with other products of a similar description to form a service product index. The weights are derived based on the value of the Services Turnover Survey (STS) data. The service product groups are then grouped together with products of a similar nature to produce industry indices. In turn, these industries are weighted together to form their respective divisional indices. These divisional indices are then weighted together to form section level indices. Section level indices are then grouped together using the appropriate weights to form the GSO and NSO SPPI indices.

Indices from service product level to section level are produced on a gross sector basis. At the aggregate SPPI level, output indices are produced on a gross and net sector basis. To calculate the GSO series weights are used that simply sum the STS sales data. To calculate the NSO series, Supply and Use data allows a split in sales to be made within and outside the service sector. This enables sales to the service sector to be excluded from the NSO weights.