

Methodology of the Monthly Index of Services

Retail Industry Review

Introduction

At the launch of the experimental monthly 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. Retail is one of the second set of industries that has been reviewed as part of the IoS Industry Review Programme. This paper outlines the findings of the Retail industry review.

Summary

This industry review recommended changes to the data sources and methods currently used by IoS and GDP(O)¹ (they both use the same data sources and methodology) to measure the Retail industry. The main changes are to use:

- Retail Sales Index (RSI) Seasonally Adjusted (SA) Constant Price (KP) data (rather than RSI Non Seasonally Adjusted (NSA) KP) as the raw data source
 - this means that the Time Series Methodologists will only need to review the seasonal adjustment of one output measure of retail (the RSI) instead of three; Retail is recognised as a particularly difficult industry to seasonally adjust
- ONS Methodology Group recommended/office standard benchmarking methods in the process of converting the initial data source (RSI's indicator of GB retail output) to total UK output of the Retail Industry (GDP(O)/IoS required indicator) - non-standard are currently used

Although the new methodology will be changed all the way back to 1994 in the system, only the open period from 2000 will be revised. The main impact caused by the change in methodology is that Retail shows weaker growth in 2001.

How important is Retail?

In terms of gross value added (GVA) weights for 2000, retail (SIC² Division 52) represents:

- 44% of the Index of Distribution (IoD)
- 7.8% of the IoS
- 5.5% of Total GVA

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

Previous methodology³

Monthly retail turnover data (sourced from the Retail Sales Inquiry⁴) were deflated by appropriate and representative components of the Retail Price Index (RPI) to derive a volume of retail sales. Since the RSI only covers GB⁵ and asks for retail turnover and GDP(O) and IoS require total turnover data at the UK level the following process took place:

- RSI NSA KP data were split into three groups (food, non-food and non-store retail & repair of household and personal goods)
- An estimate for National Health Service (NHS) receipts were added to the food and non-food groups (as the RSI data excludes NHS receipts)
- The data were then benchmarked onto the Annual Business Inquiry (ABI) total turnover for Division 52⁶
- An estimate for each of the three groups was then calculated by weighting together the series that have been allocated to each group, using gross margin weights derived from the ABI
- At this stage the NSA data was delivered to GDP(O) where it was then seasonally adjusted
- However, for IoS - seasonal factors were derived by:
$$\frac{\text{RSI NSA KP Data}}{\text{RSI SA KP Data}}$$
 and then delivered to IoS as a SA dataset

Reasons for review

The main reasons for reviewing retail were:

- The methodology of moving from GB retail output to the total UK output for the retail industry used non-standard ONS methods
- The previous system was not able to deliver annually chain-linked data (this is a requirement from Blue Book 2003 onwards)
- IoS and GDP(O) used different seasonal adjustment methods
- The way the three sets of groupings of retail based upon the SIC for quality assuring purposes needed to be reviewed to ensure that they were still relevant
- The differences caused by benchmarking between IoS/GDP(O)'s retail estimate and the RSI were difficult to explain to users

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)

³ In this report, the previous methodology refers to the methodology used prior to Blue Book 2003, and the new methodology to the methodology taken on at Blue Book 2003

⁴ The Retail Sales Inquiry is the survey source used to compile the Retail Sales Index – in this report RSI refers to the Retail Sales Index rather than the underlying survey. For further information on this please see <http://www.statistics.gov.uk/rsi>

⁵ Great Britain covers England, Scotland and Wales, United Kingdom covers Great Britain and Northern Ireland

⁶ The ABI current price data were deflated by RSI implied deflators to produce ABI constant price data, which were then used as the benchmarks

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.

For the retail trade, in accordance with Eurostat guidance, the A method for margin output is a method taking the changes in quality of the trade services into account. So far, the only method that can do so - in theory - is by taking the difference between deflated sales and deflated purchases.

The B method is to use the assumption that the volume of margins follows the volume of sales, or - equivalently - that margin-to-sales ratios are constant in constant prices.

Issues faced by the industry review

Improving the current methods that are used to move GB retail output to total UK output for the retail industry

NHS Adjustment

The RSI asks retailers to exclude NHS receipts, however these data should be included in the estimation of total output for the retail industry; an estimate for NHS receipts is therefore added to the food and non-food groups for GDP(O) and IoS. In principle the data should go through this process as it improves the short-term path. Unfortunately a number of weaknesses were highlighted, the main points are given below:

- data was supplied separately by country by the various NHS bodies, but no data was ever supplied for Northern Ireland
- the data for the England, Wales and Scotland used different definitions of NHS receipts
- data was supplied to different timescales and in some cases could only be supplied after 6 months
- non-standard methods were used to estimate for non-response – the ONS have since established office-wide standard tools

The review concluded that the difficulties in data supply together with the problems of estimation for non-response meant that the process added little value (and also had very little effect on the overall series). Given that no adjustment was made for any of the other items excluded from total turnover by the RSI and that a benchmarking process would pick this up anyway, the review recommended that this adjustment process should be stopped.

Benchmarking

In order to take the GB retail turnover estimate to UK total turnover a benchmarking process took place. Since this was set-up over eight years ago, the methods that were used have been superseded by ONS office standard methods.

The review concluded that there are three possible options

1. accept that a GB retail estimate is a reasonable proxy for total UK output of the retail industry
2. ask total turnover (excl. VAT and excise duty) on the Retail Sales Inquiry form
3. continue to benchmark to annual data that measures total UK output for the Retail Industry but using office standard methods

The first option would mean that turnover from activities such as supermarket petrol sales would not be covered and no estimate would be made for Northern Ireland. Investigations of ABI data suggest that there are differences in the movements between non-retail and retail turnover (particularly in non-store retail and repair of personal and household goods).

The second option would bring the RSI in line with other short-term turnover inquiries conducted by the ONS, and would obviate the need for benchmarking. However this is a longer-term issue.

Given the issues with the first two options the review recommended that the ONS standard benchmarking tools should be used⁷.

Should WinCSDB be used to produce the estimate

The review concluded that the production of the national accounts retail estimate should be done on WinCSDB (the ONS' bespoke time series analysis system). This would solve two key problems of chain-linking and benchmarking.

*Chain-linking*⁸

National accounts moved over to using chained volume measures for GDP and GDP components at Blue Book 2003. The RSI is not currently scheduled to be annually chain-linked, however, IoS/GDP(O) need a chain-linked retail estimate. By moving the production of the retail estimate onto WinCSDB the same methods used for other IoS/GDP(O) industries could be used to chain-link the retail estimate

*Benchmarking*⁷

It was recommended above that the office standard tool for benchmarking should be used to benchmark the retail estimate. This function currently exists in WinCSDB and cannot be easily replicated in Excel, thus reinforcing the case for moving to WinCSDB.

Seasonal adjustment

The third issue of the review was over which raw data GDP(O) and IoS should use and the relation of this with the different seasonal adjustment methods used by GDP (O) and IoS. Under

⁷ More information on benchmarking can be found in the following section within the IoS methodology - <http://www.statistics.gov.uk/iosmethodology/downloads/Benchmarking.pdf>

⁸ For more details on annual chain-linking please see Tuke and Reed 2001

the previous methodology, GDP(O) took NSA data and ran their own seasonal adjustment whilst the IoS took the seasonal adjustment of the RSI.

In reviewing the choice of raw data the review narrowed the options down to RSI NSA Current Price (CP) indices and RSI SA KP indices. The review discounted the RSI NSA CP option as the IoS and GDP(O) systems would need to duplicate the RSI system and would also need to be changed whenever the RSI system changed, say their deflators. It would also have meant that the seasonal adjustment would have to be carried out separately for the national accounts estimate, in an area that is widely recognised to be very difficult anyway.

RSI SA KP indices were preferred and the benefits are given below:

- RSI's optimum seasonal adjustment via the RSI system are used (as mentioned above the SA of the RSI retail data are particularly difficult)
- resources are saved as the time series methodologists would only need to conduct an annual seasonal adjustment review of the RSI
- IoS/GDP(O) save resources as there is no need to make system changes (e.g. seasonal adjustment parameters) following their seasonal adjustment reviews

It was deemed that these benefits outweigh the drawbacks of:

- having to benchmark a SA KP series to an ABI KP series at a less detailed level e.g. nine SIC groups (the level at which the RSI is seasonally adjusted) instead of twenty-seven (the level at which the data derived)
- by using the seasonal factors of the RSI the methodology does not completely reflect the data that are seasonally adjusted as the data are benchmarked to annual data

SIC industry aggregations

Previously the 27 industry groups surveyed for the retail industry were aggregated into 3 groups (food, non-food and non-store retail & repair of personal and household goods). The review assessed whether these grouping are still valid.

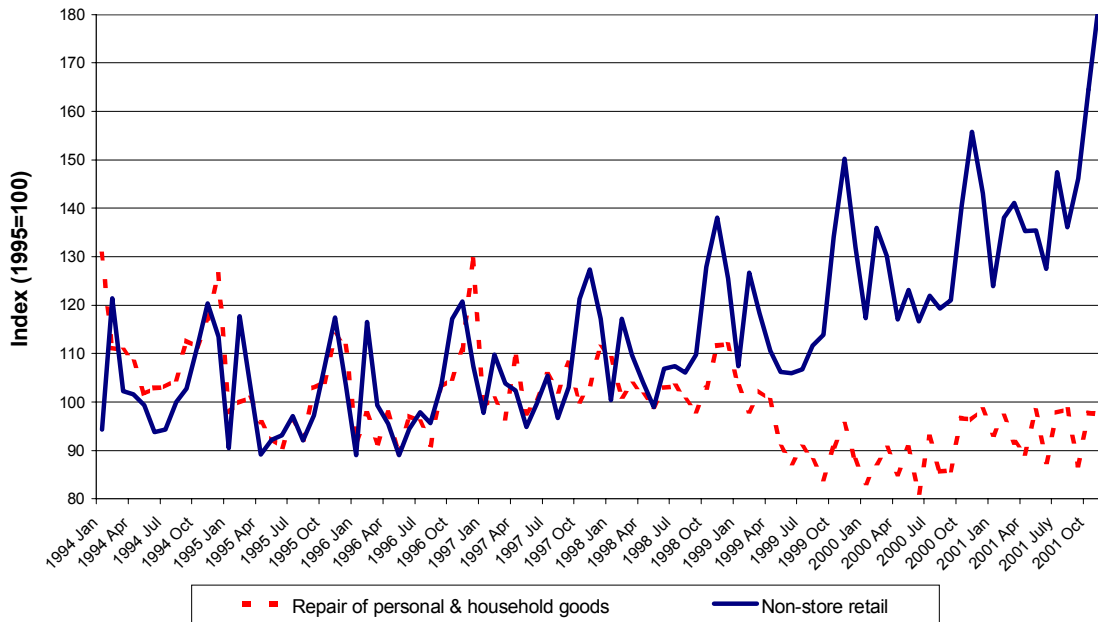
For the main two groups of food and non-food the rationale was as follows:

- food companies tend to have high turnover/low margins and have a short inventory holding period
- non-food companies tend to have higher margins and a longer inventory holding period

The review was unable to find any rationale why non-store retail and repair of personal and household goods were grouped together. The annual and short-term data was analysed to check if any homogeneity existed and the analyses show that there is little homogeneity between the two groups. The graph below compares the IoS/GDP(O) estimates for the two groups:

Figure 1

Retail: Comparison of non-store retail & repair of personal and household goods (KP NSA)



The review recommended that the repair and non-store retail components should be quality assured separately.

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. Externally the main source for consultation was with Eurostat, for guidance with measuring the output of wholesale in constant prices (their draft handbook on price and volume was used in assessing the options). The Department of Trade and Industry was also consulted.

New methodology

The review has not recommended any new data sources to derive IoS/GDP(O)'s retail estimate, as the data sources are already conceptually appropriate and are based upon ONS data that are currently fit for publishing. However the review has recommended an improved methodology for moving from GB retail turnover to UK total turnover, using ONS standard methods.

Benefits of new methodology

- Differences between the RSI and IoS/GDP(O)'s retail estimate can be explained more easily to users
- Benchmarking methodology uses ONS standard methods
- IoS and GDP(O) now use consistent methods
- Improved industry groupings for quality assurance

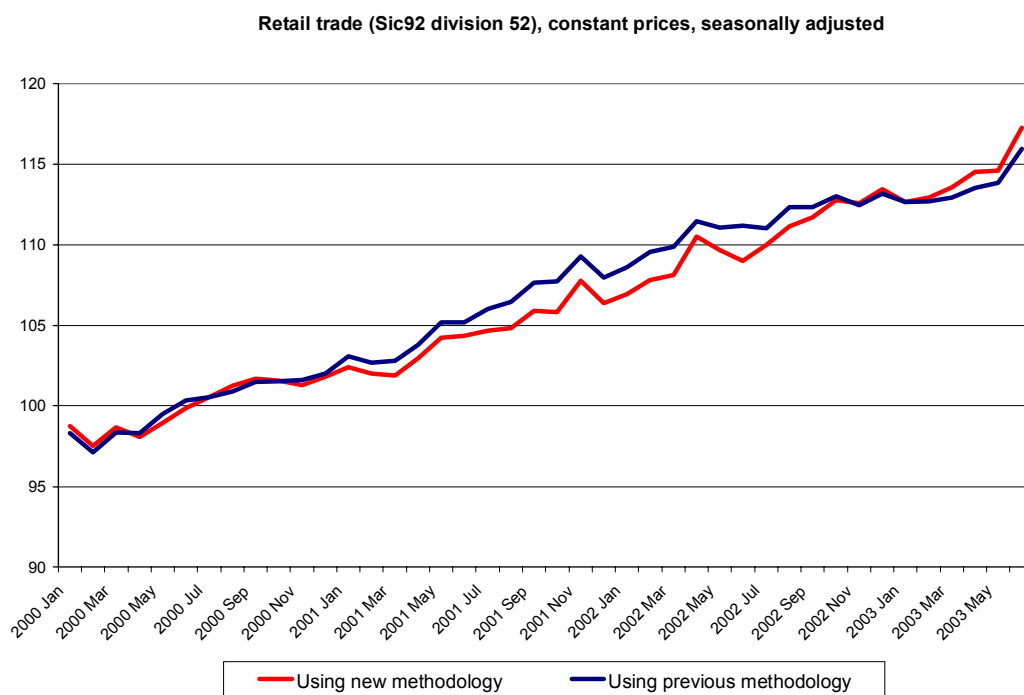
Assumptions of new methods

- Benchmarking methodology is a satisfactory method of going from GB retail output to total UK output for retail industry
- General principle that the volume of margins follow the volume of sales

Impact of new methodology

The graph below shows the impact of the new methodology on Division 52.

Figure 2



The data has been revised back to January 2000 in line with the open period for revisions set-out in the National Accounts Revisions Policy for Blue Book 2003. The new series is linked on to the 'current' series so that there is no step change at the beginning of 2000.

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:

Steve Drew
Short Term Output Indicators Division
Office for National Statistics
Room 1.473
Government Buildings
Cardiff Road
Newport
NP10 8XG

Tel: 01633 812484

E-mail: steve.drew@ons.gov.uk

References

Davies P and Hopwood P (2003). Interpreting Retail Sales Data. *Economic Trends*, No 593, pp 48-54. Available for download from

http://www.statistics.gov.uk/articles/economic_trends/ETApr03Hopwood.pdf

Pike R and Reed G (2000). Introducing the experimental monthly index of services. *Economic Trends*, No. 565, pp. 51–68. 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. 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>

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. Available for download from

http://www.statistics.gov.uk/articles/economic_trends/chainlinking.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>

Office for National Statistics (2002). Retail Sales Index Information. Available for download from:

<http://www.statistics.gov.uk/rsi>