

Interpreting Retail Sales Data

Pam Davies and Polly Hopwood Short Term Output Indicators Division Office for National Statistics

Room 1464, Government Buildings,
Cardiff Road,
Newport, NP10 8XG
Tel: 01633 812600
E-mail: pam.davies@ons.gov.uk

Summary

- The Retail Sales Index (RSI) is a base-weighted index measuring monthly movements in the average weekly retail turnover of retailers in Great Britain.
- Headline data are presented in constant prices (volume) seasonally adjusted. The seasonally adjusted series are also adjusted for calendar effects.
- Three monthly growth rates provide an adequately timely and not excessively volatile assessment of growth. Monthly growth rates can be volatile, and so can be difficult to interpret.
- The RSI is currently being rebased onto 2000=100. This process is likely to lead to revisions from January 2000. We expect to introduce the rebased series in October 2003.
- The Retail Sales Inquiry (the survey on which the Retail Sales Index is based) is currently subject to a Triennial Review; a process to provide assurance that the survey outputs still meet users needs. This review may lead to recommendations for change in the processes and methods used to produce the Retail Sales Index; any recommendations for change will be considered for implementation for October 2003 at the earliest.

Introduction

This article describes the main data sources and current practices used to produce the monthly Retail Sales Index (RSI). It also gives a guide on interpretation of the RSI, including comparisons with other data sources. The final section describes plans to rebase the RSI onto 2000=100 and also describes the Triennial Review of user need from the RSI. The article is in 7 parts:

Part 1 – Overview of the RSI
Part 2 – The Retail Sales Inquiry
Part 3 – Index construction and Deflation
Part 4 – Calendar and Seasonal Adjustment
Part 5 – Interpreting Growth Rates
Part 6 – Comparisons with Other Data
Part 7 – Development plans: rebasing and review of user need

Part 1 – Overview of the RSI

The Retail Sales Index (RSI) measures monthly movements in the average weekly retail turnover of retailers in Great Britain. It is compiled from data collected in the Retail Sales Inquiry; the inquiry goes out to a sample of approximately 5,000 retailers of all sizes every month. All of the largest 900 retailers are included in the sample, together with a sample of smaller retailers.

The Retail Sales Inquiry collects total retail turnover from retailers for standard periods of four, four, five weeks within each quarter; this is the same basis that the majority of retailers use for their accounting systems. Around three-quarters of respondents provide data for standard reporting periods. Some retailers are unable to report on the standard four or five week basis. Where this is the case, the data is adjusted to bring it into line.

The total retail turnover reported by each inquiry respondent is divided by 4 or 5 to produce the respondent's weekly average turnover for each standard period. This weekly average of sales is the basic building block in constructing the index. The total value of sales is calculated for industry groups and for all retailers; these estimates are expressed in base-weighted index form. The data are also deflated and seasonally adjusted.

Published data for all retailers, and for the six main aggregates, is presented as value not seasonally adjusted, value seasonally adjusted, volume not seasonally adjusted, and volume seasonally adjusted. The Retail Sales First Release concentrates on movements in the volume seasonally adjusted and value not seasonally adjusted estimates. A description of the process to produce the volume index is provided in part 3.

Part 2 – The Retail Sales Inquiry

The monthly Retail Sales Inquiry commenced in 1954. It was a voluntary inquiry until 1992, when it became statutory as part of a programme of measures to improve economic statistics. At the same time, the sample size was increased from 3,000 to 5,000 and the sample design was updated.

The monthly inquiry is a sample survey addressed to approximately 5,000 retail businesses in Great Britain. Retailers are stratified by 'type of store' and by employment size. Four employment size-bands are defined: employment greater than or equal to 100; employment of at least 20 and less than 100; employment of at least 10 and less than 20; employment less than 10. All 900 or so retailers with employment of at least 100 are selected. A random sample of retailers is selected from each of the three smaller size-bands: around 1 in 5 retailers from the 20 to 99 size-band; around 1 in 18 from the 10 to 19 size-band; and around 1 in 70 from the 0 to 9 size-band. The largest businesses (100+ employment) represent 69 per cent of the total turnover.

All retailers selected for the inquiry are asked for estimates of total retail turnover (including sales from stores, e-commerce (including Internet), mail order, stalls and markets, door to door and telephone sales). Retail turnover is the value of sales of goods to the general public for personal or household use.

Estimates are produced for each type of store by size-band 'cell'. These detailed estimates are aggregated to produce estimates of average weekly sales for the 22 individual industries, the main industry aggregates and for retailing as a whole.

Part 3 – Index Construction and Deflation

Index construction

The RSI is a base-weighted (Laspeyres) index. Estimates of average weekly turnover are converted to index form by comparing with the appropriate average weekly turnover in the base year (currently 1995).

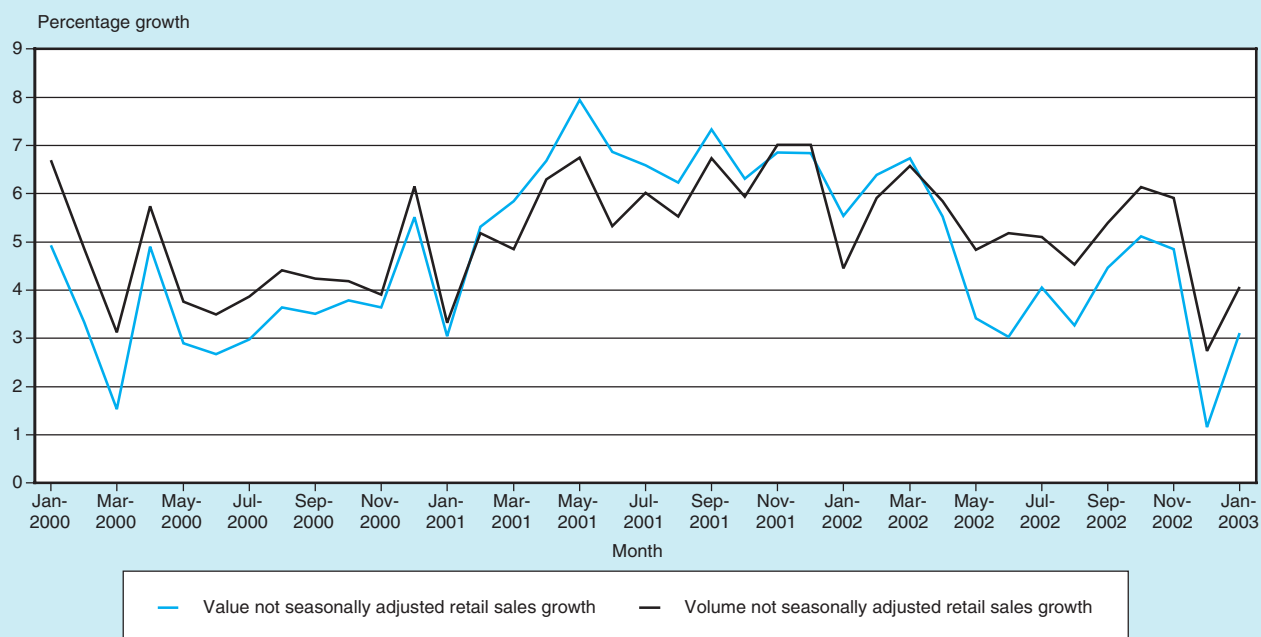
Deflation

The value indices show the pattern of average weekly sales in current prices (the actual value of money 'through the till'). There is also interest in the pattern of sales after allowing for the effect of price changes.

The value estimates are converted into constant price or volume estimates by using information from the Retail Prices Index (RPI). The approach taken involves weighting together detailed commodity

Figure 1

RSI all retailing, value and volume, not seasonally adjusted percentage growth month on the same month a year earlier



RPIs to produce deflators at the detailed industry level. The weights are derived from information on the breakdown of sales by commodity derived from the Annual Retail Inquiry in the base year (currently 1995). These deflators are then applied to the value data to produce volume estimates; industry aggregates are derived by summing the appropriate volume data and the index numbers are derived by dividing by average weekly turnover in the base year.

The deflators used in the RSI are not published but some information on the implied deflators can be derived from published data by comparing the volume and value data.

Figure 1 compares annual growth rates in the value and volume series (not seasonally adjusted). The value and volume series show similar patterns of movement, although the volume series is at a slightly lower level than the value series when prices are rising.

Part 4 – Seasonal and Calendar Adjustment

Figure 2 below illustrates the profound seasonality exhibited by retail sales each year. Sales build up heavily towards Christmas and then fall away very sharply in January. There is a modest build up in the summer and fallback in the autumn. Sometimes there is a more modest build up to Easter and fall back afterwards. However, while the broad sweep of these patterns are similar from year to year, many complications can occur that distort the seasonal patterns. Examples of these complications, and the processes for dealing with them, are described below under calendar adjustment.

The RSI is seasonally adjusted using X11ARIMA, the standard program for seasonal adjustment, and follows best practice guidelines for dealing with routine features of the data. There are also special measures in place to deal with particular issues: the phase-shift effect and moving holidays. The process that deals with these special measures is known as calendar adjustment and is applied within X11ARIMA (as permanent prior adjustment factors).

Calendar adjustment

Calendar adjustment takes account of two effects in the data:

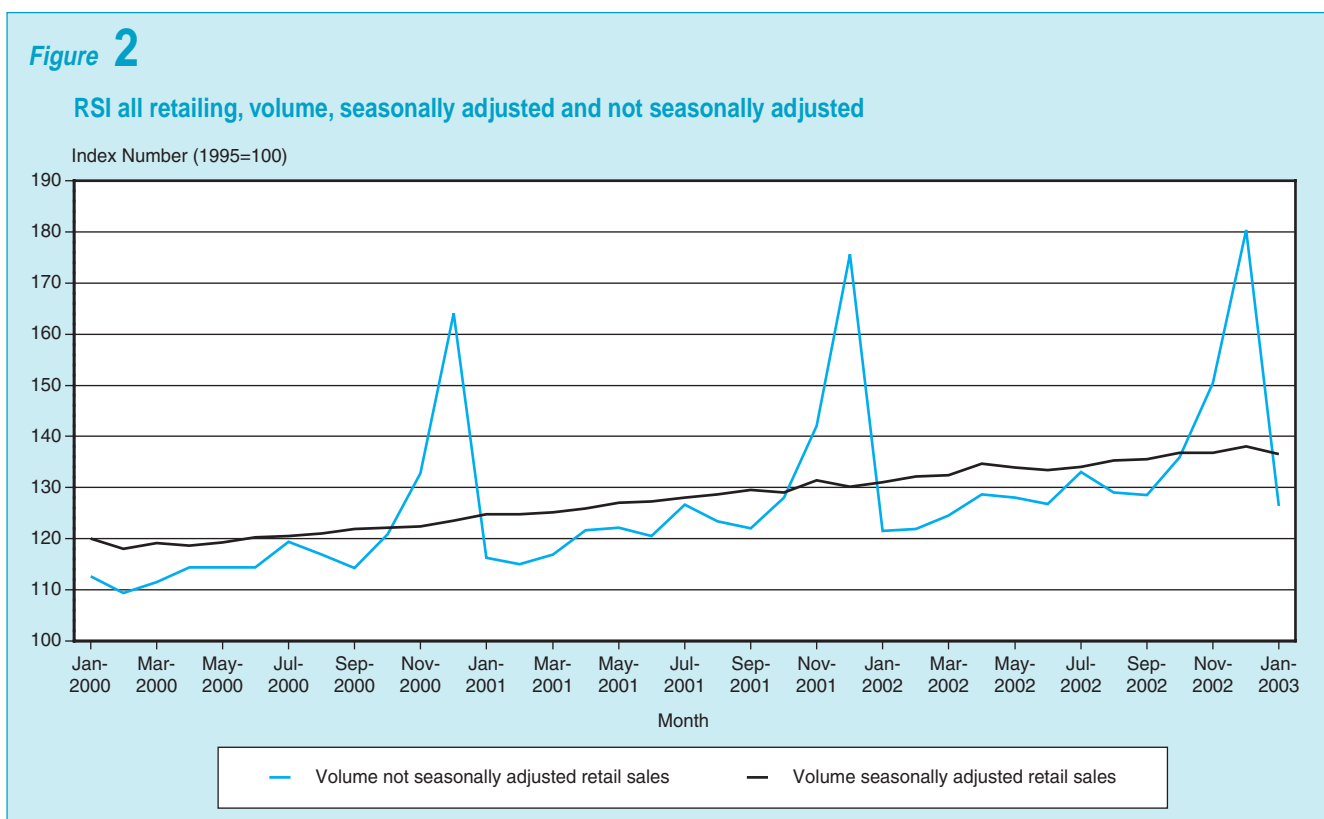
- Moving bank holidays;
- The phase-shift effect.

Moving bank holidays

At the same time as adjustments are made to deal with the phase-shift effect, adjustments are also made for moving public holidays. When working with calendar month based data, the only holiday that moves between months is Easter. However, when data is compiled on a four, four, five basis the late May Bank Holiday and the August Bank Holiday also become moving holidays, since they do not always occur in the same standard RSI period.

The phase-shift effect

The RSI is presented as an index of average weekly sales for four, four, five week standard periods within a quarter. Data presented on these standard periods are not subject to trading day variation (for



example, in a calendar month there are sometimes four Saturdays and sometimes five). However, the standard periods do introduce a 'phase-shift' effect, associated with the fact that the standard periods do not match calendar months and move slightly each year relative to the calendar month. In a typical year, the standard periods total 52 weeks or 364 days compared to 365 (366 in a leap year) in a calendar year. As a result, the standard periods 'slip back' one (or two) days every year. The reporting year is brought back into line with the calendar year by adding an extra week, normally to January, every five or six years. Adjusting for the phase-shift moves the estimate based on the standard period onto an 'average' month.

Figure 3 illustrates how the December standard period moves relative to the calendar month. Note that the December standard period is always five weeks long, so it is always longer than the calendar month, and that the December reporting period sometimes ends in December and sometimes in January.

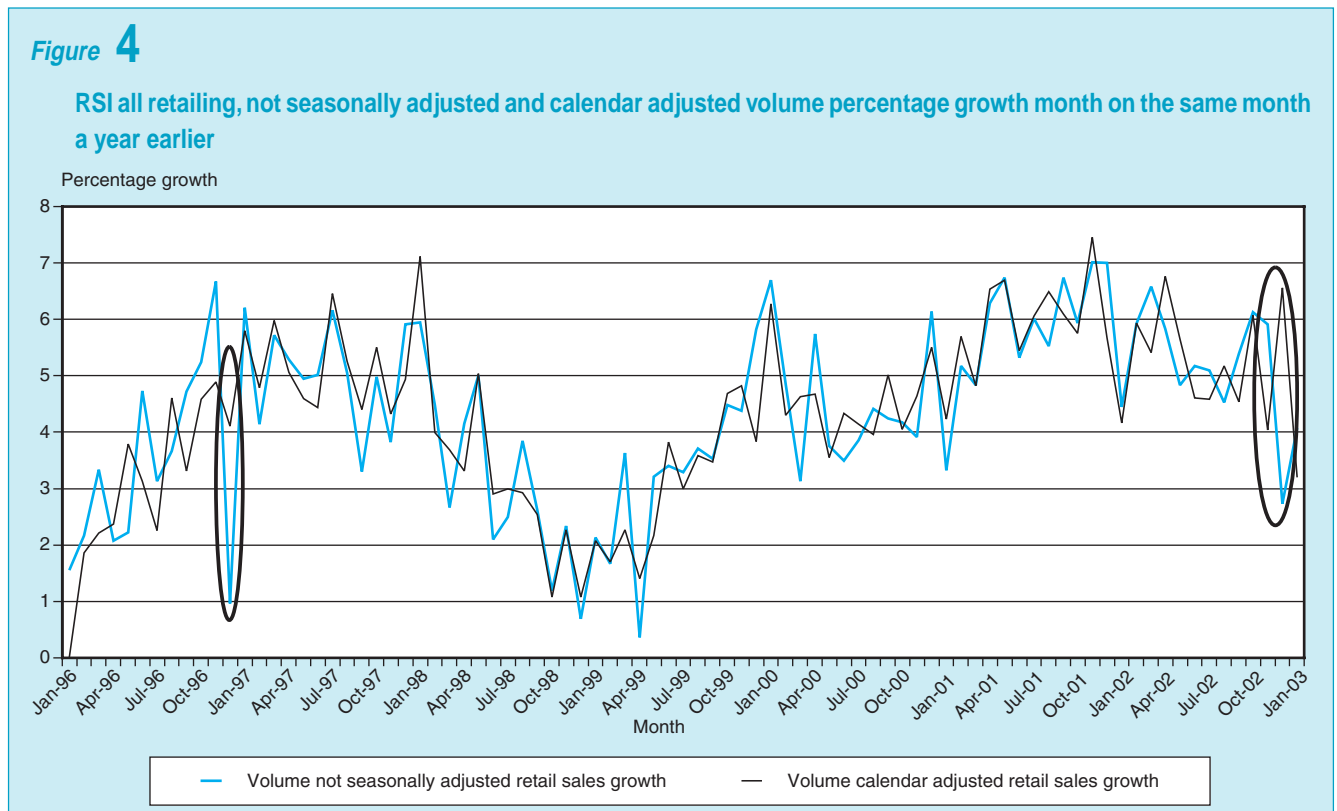
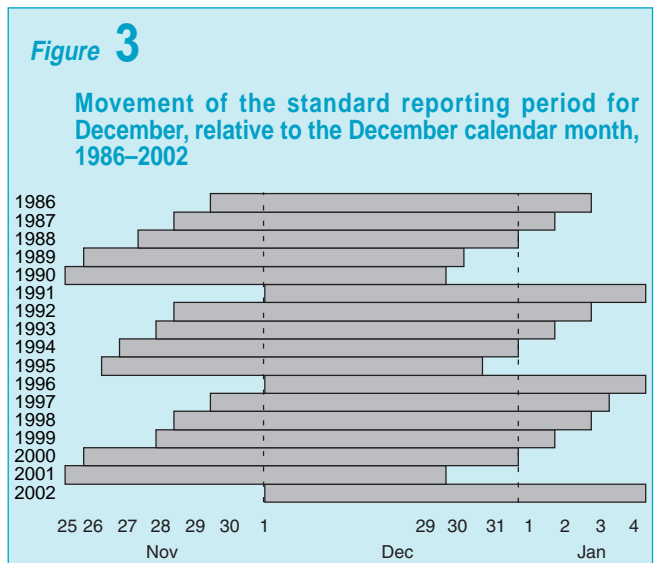
The impact of calendar adjustment

Calendar adjustment has a large impact in months such as December, where retail sales in the first and last weeks of the standard period are considerably different. The greatest effect on annual growth rates is observed in years with a five week January. In these years standard periods fall as late as possible and are compared with months (in the previous year) when standard periods fall as early as possible.

Figure 4 presents a time series of annual growth rates before and after calendar adjustment. The two months, December 1996 and December 2002, where calendar adjustment has the greatest impact are highlighted. Calendar adjustment for December 2002 is explained in more detail below.

An example of calendar adjustment

The December 2002 sales period (1 December 2002 to 4 January 2003) started and finished 6 days later than the corresponding period for December 2001. Although retail sales in January are boosted by



the January sales, they are typically lower than average weekly sales in the run up to Christmas. In not seasonally adjusted terms, annual growth in December 2002 was +2.7 per cent. To produce average sales for a typical week in December 2002, the calendar adjustment process added 3.9 percentage points to annual growth. After calendar adjustment (but before seasonal adjustment) the annual growth was therefore +6.6 per cent; this is our best estimate of the growth we would have observed if we had been able to collect retail turnover for average Decembers in both years.

Part 5 – Interpreting Growth Rates

In general, any discussion of retail sales tends to be based on growths derived from the volume measure seasonally adjusted, unless otherwise specified. A number of growth measures are derived from the RSI: three months on previous three months; three months on the same three months a year ago; month on previous month and month on same month a year ago.

Monthly movements and the interpretation of growth

Discussion of retail sales figures often focuses on whether there is evidence of sales growth slowing. Figure 5 shows monthly movements of the retail sales index since 1995.

When interpreting a monthly measure such as retail sales, a measure of growth is needed that is not excessively volatile, yet provides a reasonably up-to-date assessment of what is actually going on. The historical volatility of monthly growth rates in Figure 5 suggests that

they do not provide such a guide. Over the end of 2002, for instance, the index grew rapidly in October, was flat in November, grew rapidly in December and fell sharply in January 2003.

The growth measure in Figure 6 is seen to be reasonably smooth suggesting that successive readings from this measure offer a reasonable guide to the behaviour of retail sales. Again, to take the recent period as an example, the three months on previous three months growth rates were strong during 2001 and 2002, except for those months affected by the Queen’s Golden Jubilee.

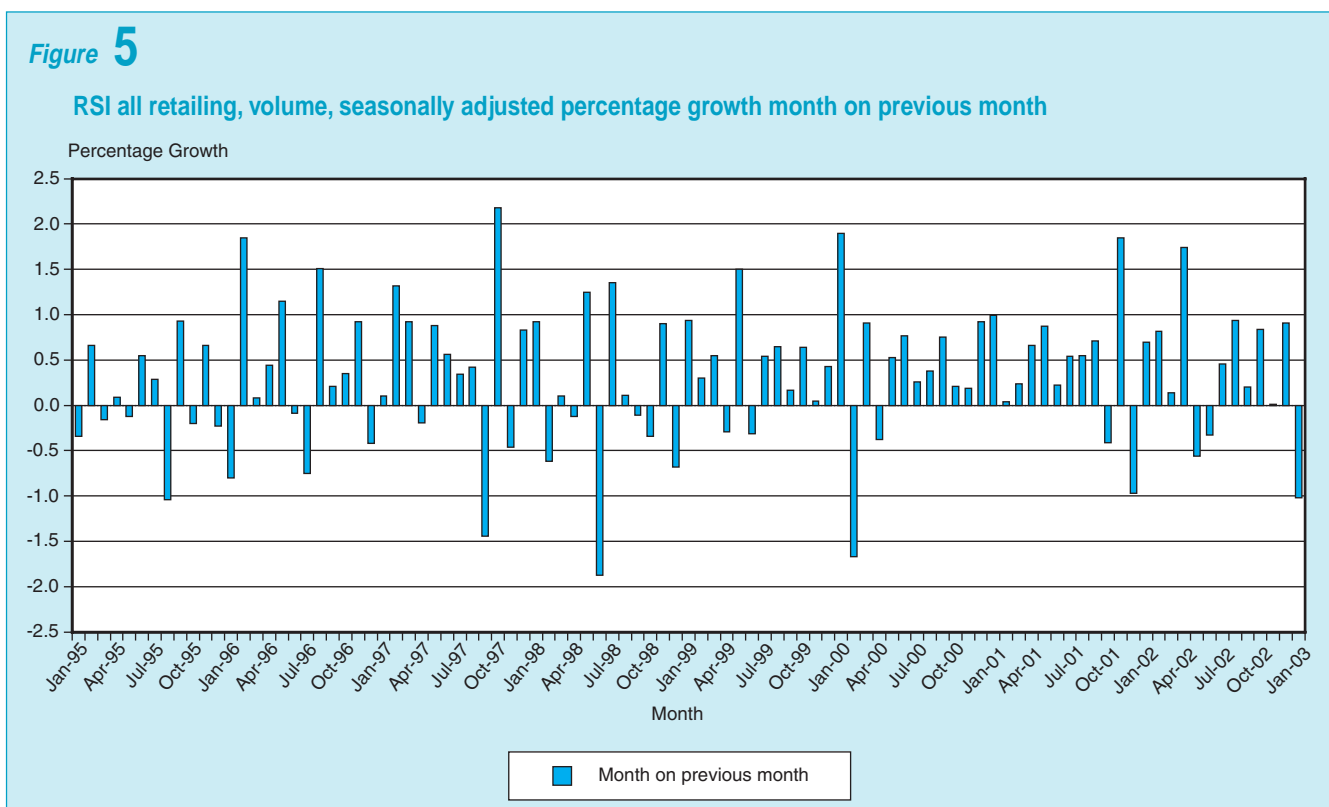
As the month on month growth rate can be volatile, ONS briefing usually concentrates on the three months on previous three months measure.

Revisions to growth rates

First estimates of retail sales growth can be revised in later months. There are two main sources of revision to the series:

- late returns from retailers;
- reassessment of seasonal adjustment.

First estimates are based on returns from at least 60 per cent of retailers selected for the sample; these respondents account for over 90 per cent of selected turnover. The RSI revisions policy takes account of inquiry returns received up to two months after the end of the month. Final results, produced two months later, are typically based on responses from around 80 per cent of sample members.



The policy of current updating of seasonal adjustment factors can lead to revisions to past months even when unadjusted estimates are not changed. The policy is to revise seasonal factors for the current month, the previous two months and the current month one year earlier.

Part 6 – Comparisons with Other Data

Analysts often compare the RSI with two external indicators:

- the British Retail Consortium (BRC) Sales Monitor;
- the Confederation of British Industry (CBI) Distributive Trades Survey.

Figure 6

RSI all retailing, volume, seasonally adjusted percentage growth, 3 months on previous 3 months

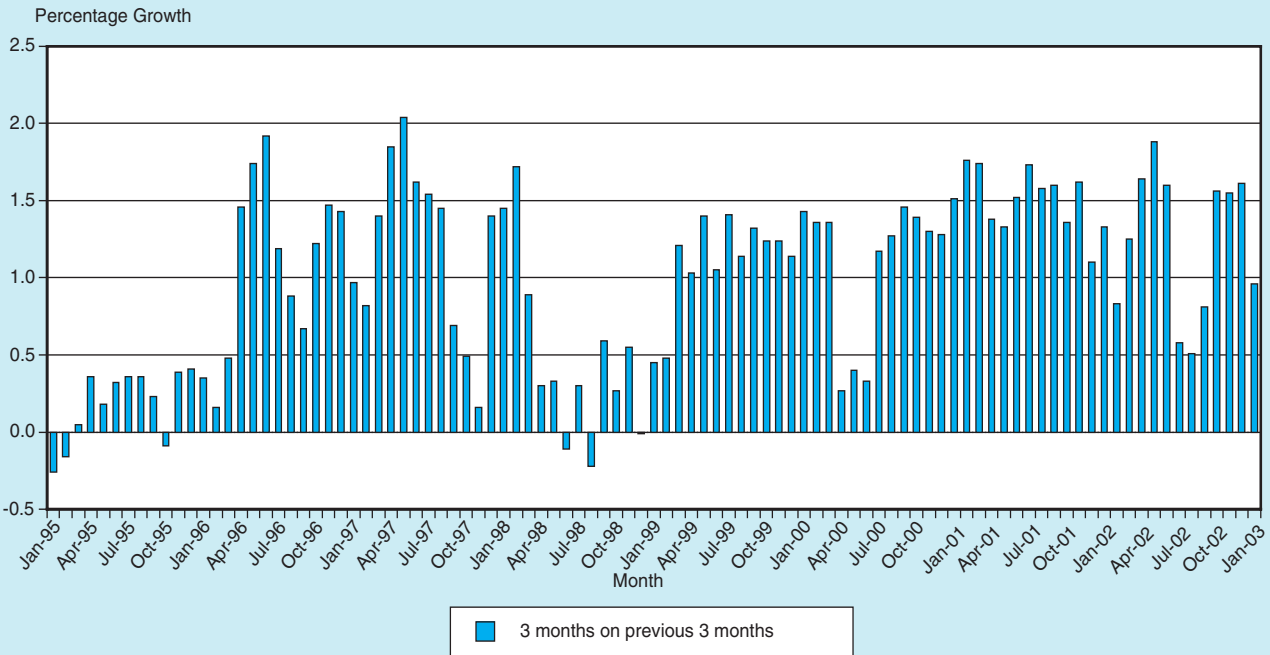
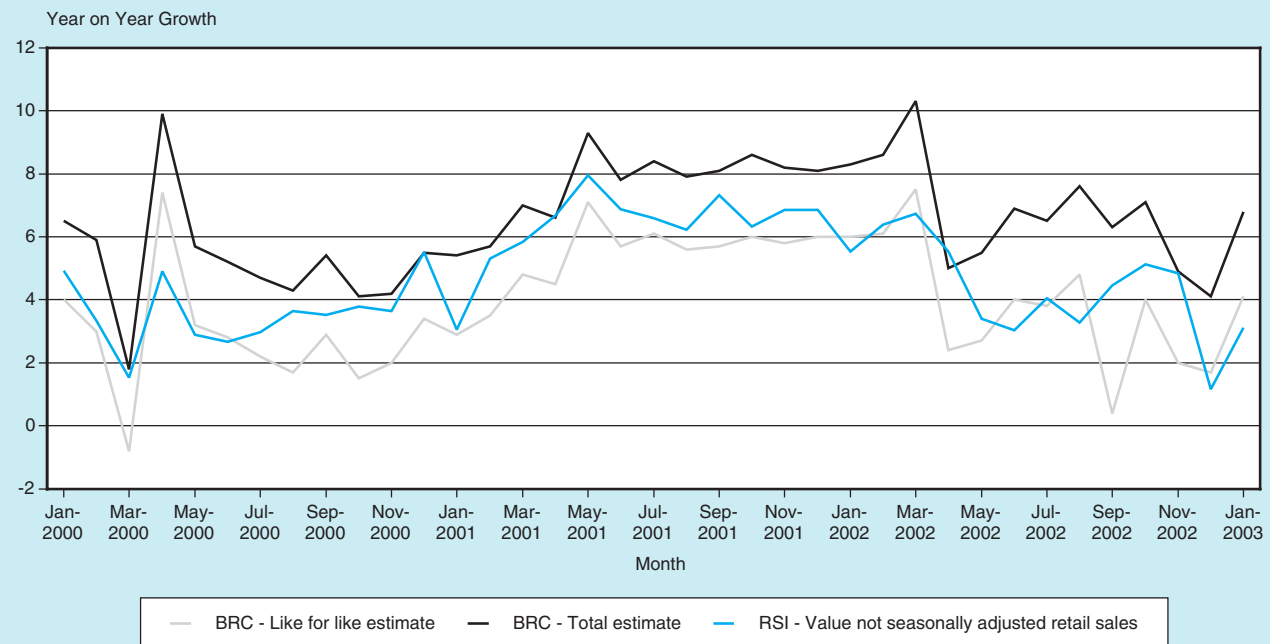


Figure 7

RSI (all retailing, value, not seasonally adjusted) and BRC (total and like-for-like percentage growth month on the same month a year earlier)



Comparisons between RSI and BRC

The BRC measure the value of sales based on data provided by 80 or so of the largest retailers (compared with a sample size of approximately 5,000 for the RSI). They ask retailers for total and like-for-like retail sales. Note that the BRC estimates are usually based on the same four, four, five reporting periods as used in the RSI, although the BRC used slightly different reporting periods in December 2002 and January 2003. The BRC do not deflate or seasonally (or calendar) adjust their estimates and present their results as the growth between the latest month and the same month a year earlier. Figure 7 compares the RSI value not seasonally adjusted series with BRC data. Both series show month on same month a year earlier growth rates. Typically the RSI series falls between the two BRC series.

The CBI Distributive Trades Survey

The CBI distributive trades survey reports the balance of retailers reporting a higher volume of sales compared with last year. This qualitative survey asks up to 200 retailers whether sales volumes were higher or lower compared with the same month a year earlier. It is very difficult to draw comparisons between CBI and RSI results.

Part 7 – Development plans

Rebasing onto 2000=100

We are planning to rebase the RSI from 1995=100 to 2000=100 and to publish the results in October 2003. This is a routine five-yearly process. Although we aim to chain-link the RSI, we do not expect to be able to do this to the same timetable as for the UK National Accounts (the plan is to publish chain-linked National Accounts in *Blue Book 2003*). However, when National Accounts chain-linking is introduced, the National Accounts will be chain-linked up to 2000, and will be on a 2000=100 base for the period from 2000. The National Accounts and RSI will thus be on the same basis for the most recent periods.

For the RSI, the main stages in the rebasing exercise are:

- re-weight the deflators from the current base year (1995) to the new base year (2000);
- re-reference the index onto 2000=100.

As in previous rebasings:

- RSI turnover estimates in the base year (2000) will be re-set to equal Annual Business Inquiry estimates in 2000;
- turnover estimates for each month from January 2000 to date will be re-worked (to take account of the new level in the base year and latest data from retailers).

Review of the Retail Sales Inquiry

We are carrying out a Triennial Review of the Retail Sales Inquiry (the inquiry which underlies the Retail Sales Index) as required under the Prime Minister's instruction on the control of statistical surveys. These three yearly reviews of surveys are to provide assurance that the surveys are still required, that they continue to meet their user needs and impose the minimum burden on contributors subject to meeting user needs.

This review might lead to recommendations for change in the design and implementation of the Retail Sales Inquiry. Any recommendations for change will be considered for implementation for October 2003 at the earliest.