Office for
National Statistics

A Quick Guide to the Retail Sales Index
Version 2.1

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1. Introduction

The Retail Sales Index (RSI) measures the value and volume of retail sales in Great Britain on a monthly basis. The RSI is a key economic indicator and one of the earliest short-term measures of economic activity. It is used to estimate consumer spending on retail goods and the output of the retail sector, both of which are used in the compilation of the National Accounts.

The main output measures include value and volume estimates, in both seasonally adjusted and non-seasonally adjusted forms. The value estimates reflect the total turnover that businesses have collected over a standard period, while the volume estimates are calculated by taking the value estimates and adjusting to remove the impact of price changes. The value and volume measures of retail sales estimates are widely used in private and public sector institutions, particularly by the Bank of England and Her Majesty's Treasury, to assist in informed decision and policy making.

Further information on estimated prices and the value of retail sales by commodity are published alongside the RSI.

Internet Sales statistics are also published in value, seasonally adjusted and non-seasonally adjusted form. More information on these statistics is available in the Quick Guide to Internet Sales Statistics.

2. Defining retail trade

The industries included in the Retail Sales Inquiry are as defined by the UK Standard Industrial Classification (SIC) 2007[1]. Retail sales statistics published in the Retail Sales Statistical release[2] are presented for all retailing including and excluding automotive fuel and in four retail sector groupings:

- predominantly food
- non-food
- non-store retailing
- automotive fuel

The non-food sector is further broken down to provide statistics on:

- non-specialised stores or department stores
- textiles, clothing and footwear
- household goods stores
- other specialised stores

At this level, statistics on volume and value of retail sales, seasonally adjusted, are published.

Retail sales statistics published in the Retail Sales tables[3] on a monthly basis are presented by retail sector groupings and more detailed industry subgroups. At this level, non-disclosive statistics, for further information see section 9, covering small and large businesses, non-seasonally adjusted, are provided.

Table 1 shows the industry groups and subgroups for which data is published as well as the proportion of retail sales represented by each group. The previous weights are presented in Annexe 1.

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[1] http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html

[2] http://www.ons.gov.uk/ons/rel/rsi/retail-sales/november-2013/index.html

[3] http://www.ons.gov.uk/ons/rel/rsi/retail-sales/november-2013/rft-rsi-tables-november-2013.xls

Table 1, Retail sales index categories and their percentage weights in 2012

Publication category		Percentage of All retailing	RSI Aggregate	SIC**	Description
Predominantly food stores		41.5	Agg1		
	Non-specialised food stores	38.5		47.11	Non-specialised stores with food, beverages or tobacco predominating (e.g. supermarkets)
	Specialist food stores	2.2	Agg26	47.21	Fruit and vegetables
				47.22	Meat and meat products
				47.23	Fish, crustaceans and molluscs
				47.24	Bread, cakes, flour confectionery and sugar confectionery
				47.29	Other food, beverages and tobacco in specialised stores
	Retail sale of alcoholic drinks, other beverages and tobacco	0.8	Agg27	47.25	Alcoholic and other beverages
				47.26	Tobacco products
Predominantly non-food stores		41.3	Agg12		
Non-specialised stores		8.1		47.19	Non-specialised stores where sales of food, beverages and tobacco is not predominant (e.g. department stores)
Textile, clothing and footwear stores		12.2	Agg5		
		0.19		47.51	Textiles
		10.69		47.71	Clothing
		1.29		47.72	Footwear and leather goods
Household goods stores		8.5	Agg7		
		2.92		47.52	Hardware, paints and glass
		2.08		47.54	Electrical household appliances
		3.11		47.59	Furniture, lighting equipment and household articles not elsewhere classified
		0.43	Agg31	47.43	Audio and video equipment
				47.63	Music and video recordings
Other non-food stores		12.5	Agg13		
	Pharmaceutical, medical, cosmetic & toilet articles	0.31		47.73	Dispensing chemists
		0.14		47.74	Medical and orthopaedic goods
		0.84		47.75	Cosmetic and toilet articles
	Other retail sale in specialised stores	1.23	Agg32	47.41	Computers, peripheral units and software
				47.42	Telecommunications equipment
		0.59		47.53	Carpets, rugs, wall and floor coverings
		1.22	Agg35	47.61	Books
				47.62	Newspapers and stationery
		2.18	Agg33	47.64	Sporting equipment
				47.65	Games and toys
	Other retail sales in specialised stores not elsewhere classified (NEC)	1.15		47.76	Flowers, plants, seeds, fertilisers, pet animals and pet food
		1.42	Agg28	47.77	Watches and jewellery
		2.81		47.78	Other retail sales of new goods in specialised stores
		0.64		47.79	Second-hand goods in stores
Non-store retailing		5.7	Agg14		
	Mail order houses	4.9		47.91	Mail order houses (including internet retailers)
				47.80	Stalls and markets
	Other non-store retailing	0.8	Agg11	47.99	Other non-store retail sale
Automotive Fuel		11.5		47.30	Automotive fuel for use in motor vehicles and motorcycles

* Based on aggregated annual data from the Retail Sales Inquiry, 2012.

** UK Standard Industrial Classification 2007

3. Scope and coverage

The RSI is compiled using data from the Monthly Business Survey – Retail Sales Index (MBS-RSI). The MBS-RSI covers businesses which are engaged in retail trade and which operate in Great Britain; that is England, Scotland and Wales. It does not include Northern Ireland, the Isle of Man or the Channel Islands.

Retail sales covers spending on goods, as such spending on services such as holidays, air fares & train tickets, insurance & banking are not covered and retailers are asked to separate out turnover from services from their return.

When using RSI as an estimate of the performance of the high street users should note that these services plus services such as hotels & restaurants and other catering services are also not included. Estimates of the performance of these services can be found in the Index of Services[4].

4. Data collection and sampling

4.1 Questionnaire

Retailers are asked to provide total retail turnover inclusive of VAT, including sales from stores via the Internet, mail order, stalls and markets, door-to-door and telephone sales. A separate question is asked for total retail sales generated via the Internet only.

Supplementary information on commodity breakdowns sold by retailers is collected through the Monthly Commodity Survey (MCS). Retailers included in this survey are asked to provide the same information as those within the MBS-RSI sample and also the turnover generated for the following:
- Food
- Alcohol, tobacco and confectionery
- Clothing and footwear
- Household goods
- Other
- Automotive fuel.

The accounting period follows a 4-4-5 week pattern. As a result, over the course of a 365 day calendar year (or 366 days in a leap year),one (or two) trading days a year are lost. To compensate every five or six years an extra week is added to the cycle, usually in January. The most recent five week January was in 2008 and the next will be January 2014.

Most businesses are able to report data for these accounting periods, however, some provide data on a calendar month basis. The questionnaire asks respondents to indicate the dates to which the returned turnover data relates, that is, accounting period or calendar month.

In addition, each quarter a sub-sample of 2,100 retailers are asked to provide information on employment including male and female, and full and part time splits. These data are then used in the workforce jobs section of the Labour Market Statistical Bulletin[5].
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[4] http://www.ons.gov.uk/ons/rel/ios/index-of-services/october-2013/stb-ios-october-2013.html
[5] http://www.ons.gov.uk/ons/rel/lms/labour-market-statistics/december-2013/index.html

4.2 Mode of collection
For the main retail sales sample, data are collected using telephone data entry (TDE). Respondents are sent a letter specifying the questions and instructions on how to return their data through the TDE system.

For MCS respondents data are collected through the completion and return of a paper questionnaire.

In order to ensure a good response rate, approximately 64% each month, response chasing is conducted by trained staff and allows respondents to return data over the phone.

4.3 Sampling
Retail sales data are collected from a sample of approximately 5,000 retailers across Great Britain. The sample represents the whole retail sector and includes all large retailers and a representative sample of smaller businesses. The known retail industry population is approximately 200,000 businesses and while the sample represents 2.5% of this population in terms of number of businesses the sample covers approximately 93% of all known turnover in the retail industry.

The Inter-Departmental Business Register (IDBR)[6] is used as the sampling frame for the MBS-RSI. A sampling frame is a list of all units in the population of interest, in this case a list of all businesses in the UK that we can obtain information from.

A stratified random sample is used to ensure small and large businesses are represented according to the retail trade population structure. First retailers are classified to their industrial grouping as defined by SIC 2007. Five bands or strata are then created based on employment size:
 • Band one, 0-4 employment
 • Band two, 5–9 employment
 • Band three, 10–99 employment
 • Band four, 100+ employment
 • Band five, employment between 10–99 with turnover greater than £60 million a year.

A random sample is taken from bands one, two and three. Retailers in bands four and five are continuously sampled.

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[6] http://www.ons.gov.uk/ons/about-ons/products-and-services/idbr/index.html

5. Editing, validation and imputation

5.1 Editing and validation
The MBS-RSI uses an editing and validation approach known as selective editing. Selective editing is an internationally recognised method that uses a data based approach to assess the influence of business estimates on the aggregate outputs.

The selective editing approach means that the editing process should be more efficient and effective since it will only edit potential errors that have a significant impact on final outputs. Under selective editing key variables on the questionnaire are defined and scores derived for these. The scores compare the value provided on the questionnaire with expected values, where the expected values are generally estimated using past data or other available information related to the variable, for example, from administrative sources. The scores from 'key' variables are then combined to derive a score for every questionnaire. This derived, single score for the business's return is then tested against a methodologically set threshold. If the score is higher than the defined threshold then the questionnaire will fail and be flagged for manual editing. Thresholds have been derived and set to ensure minimum bias is introduced from not editing values that may have been edited under the previous edit all returns system. Thus selective editing does result in an adverse impact on output quality. In order to ensure that all errors are captured, before questionnaires pass through selective editing they are subjected to automatic editing and then a number of user defined checks. For example, these will include checks to detect changes to reporting periods and implausible returns such as turnover being less than zero.

5.2 Imputation
Each month approximately 64% of respondents complete and return the MBS-RSI questionnaire, equating to approximately 93% coverage by turnover. Ratio imputation, explained below, is used to provide estimates for non-respondents.

The basic method of ratio estimation is to impute for the current response Y_t using the response from the previous period Y_{t-1} and a growth factor (or imputation link) R. to estimate a value for the current non-response (Y_t).

The methods used for imputation are currently under review. More information on this review will be published shortly.

6. Estimation
Estimation is the process of approximating some characteristic of a population, in this case retail sales in Great Britain, when information is available only for a sample of the population. In order to provide estimates of the full retail sector, ratio estimation is used. Ratio estimation is used when the ratio between the returned turnover over the registered turnover variable on IDBR is roughly constant and the variance of the returned turnover can be assumed to be proportional to over the registered turnover. The estimate for retail sales in Great Britain is then given by multiplying the estimate of the ratio by the number of retail business on the IDBR.

Unlike the method used to estimate the full retail sector an expansion or number raised estimator is used to estimate the value of Internet retail sales. Number raised estimation works by 'expanding' the sample total up to the size of the population by multiplying the sample total by the ratio of the number of retailers on the IDBR divided by the number of business within the sample.

7. Indexing
Estimates of retail sales are published in index form rather than in monetary form. There are two types of index published in the form of value indices and chain volume measures.

7.1 Reference period
The reference period is the year for which the index is scaled to equal 100. The RSI value and volume indices are currently published in index form with a reference year of 2010 equal to 100.

To keep RSI in line with the UK National Accounts, the reference year is updated each year when weights are available from the Blue Book[7]. The change to the reference year is a simple calculation and does not impact on the movements of the series.

7.2 Deflation
Value estimates of retail sales reflect both price and volume changes. To remove the direct effects of prices changes value data are deflated to produce RSI volume measures. A separate price deflator is used for each RSI industry at four digit SIC.

Industry price deflators are calculated from commodity price indices using weights appropriate to the relevant industry derived from the Annual Business Survey (ABS)[8] data on the value of turnover. Currently, 2007 ABS commodity weights are used along with price indices derived from the Consumer Price Index (CPI)[9]. These commodity weights are currently under review.

7.3 Chained volume measures
The chained volume measures of retail sales are annual re-weighted chain Laspeyres indices referenced to current price values, currently in 2010. For each year the values for each good in current prices and previous year prices are calculated. These values are then aggregated using weights for each retail industry derived from the RSI.

Each year the series is re-referenced and comparability with previous years is achieved by chain-linking the series together to form a continuous time series. An average of the values for October, November and December is used to provide the link factor.

Chain-linking starts at the lowest possible level of aggregation. For RSI this means that aggregation uses the small and medium businesses combined with the large businesses for each industry within each retail sector. These estimates are used to create a chain-linked estimate for all businesses for each industry. Higher level chain linked aggregates are derived in a similar way.

The chain-linking method used is consistent with the standard National Accounts method[10].

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[7] http://www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-national-accounts/the-blue-book--2013-edition/index.html

[8] http://www.ons.gov.uk/ons/about-ons/get-involved/taking-part-in-a-survey/information-for-businesses/a-to-z-of-business-surveys/annual-business-survey/index.html

[9] http://www.ons.gov.uk/ons/guide-method/user-guidance/prices/cpi-and-rpi/consumer-price-indices--a-brief-guide.pdf

[10] www.ons.gov.uk/ons/rel/elmr/economic-trends--discontinued-/no--630--may-2006/methodological-note--annual-chain-linking.pdf

7.4 Implied deflator

The deflators used within the RSI are not published however it is possible to determine the implied deflator by dividing the value series by the volume series and multiplying by 100. Growth rates from the implied deflator are published for total retail sales as well as the main industry groupings allowing users to estimate store price inflation.

8. Time series analysis

Seasonally adjusted estimates are derived by estimating and removing calendar effects (for example Easter moving between March and April) and seasonal effects (for example increased spending in December as a result of Christmas) from the non-seasonally adjusted (NSA) estimates. Seasonal adjustment is performed each month, and reviewed each year, using the standard, widely used software, X-12-ARIMA. Before adjusting for seasonality, prior adjustments are made for calendar effects (where statistically significant) such as: returns that do not comply with the standard trading period, bank holidays, Easter, and the day of the week Christmas occurs.

While the number of trading days in a set period remains the same, the standard reporting periods of 4-4-5 weeks 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. As a result, the standard periods fall back one day each year (or two days for a leap year).

Every five or six years, the reporting year is brought back into line with the calendar year by adding an extra week, normally to January.

The seasonally adjusted estimates also have corrections for bank holidays; Easter effects which are caused when Easter falls late in March or early in April and the day of the week Christmas occurs. Prior connections are applied as necessary. Corrections are estimated and applied where there is a statistically significant effect.

The calculation of the RSI has an adjustment to compensate for calendar effects which arise from the difference in the reporting periods.

9. Confidentiality and disclosure

The Retail Sales Index is compliant with the Code of Practice for Official Statistics[11], Principle 5.

Principle 5, Practice1, states:
> Ensure that official statistics do not reveal the identity of an individual or organisation, or any private information relating to them, taking into account other relevant sources of information.

All necessary steps are taken to protect the confidentiality of data collected from retail businesses. This includes statistical disclosure controls to ensure that individual businesses are not identified in the published statistics.

When data are shared with other bodies, for example Eurostat and the Scottish Government it is done so under legislation and using secure electronic file transfer methods.

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[11] http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html

10. Dissemination

Statistics covering retail sales estimates are disseminated monthly through:

- The Retail Sales Statistical Bulletin

- Retail Sales Tables

The retail sales summary outlines the key messages within each month's data. This includes the key drivers for movements within particular sectors for both value and volume indices. The Retail Sales Statistical Bulletin presents the key messages within the data, analysis of raw data including analysis by size of business, a detailed sector summary focusing on the three main aggregates: predominantly food, predominantly non-food, and non-store retailing.

Time series data is available for users to download. This can be found at www.ons.gov.uk/ons/datasets-and-tables/index.html

Retail sales publication dates can be found on the UK National Statistics Publication Hub release calendar www.statistics.gov.uk/hub/release-calendar/index.html

11. Reliability of estimates

There are two possible types of error in estimates of retail sales, sampling error and non-sampling error.

- Sampling error occurs because a sample, rather than the entire population, is surveyed. It is the difference between the true value for the population and the estimated value. One way of measuring this difference is through standard errors[12].

- Non-sampling error arises from inaccuracies in collecting, recording and processing the data. The most significant of these errors are: misreporting of data items, deficiencies in coverage, non-response, and processing errors. Every effort is made to minimise reporting error by the careful design of questionnaires, intensive training and supervision of editing and validation staff, and efficient data processing procedures.

12. Revisions

Retail Sales non-seasonally adjusted data is revised as needed. This typically occurs due to late data returns, updated respondent information, replacing adjustments with actual data, and reclassifications of respondents to the appropriate category either within or out of retail. Changes are not made to any non-seasonally adjusted data prior to 2001. Revisions to non-seasonally adjusted data will directly impact on the seasonally adjusted estimates.

Revisions to all published seasonally adjusted estimates are not constrained or restricted as they are for other short term indicators and the national accounts. Revisions are allowed to occur naturally each month along the full length of each time series as a consequence of the direct seasonal adjustment of the component time series. Aggregate seasonally adjusted estimates will then be derived. Any revisions from the directly seasonally adjusted time series will then occur as part of the higher level aggregation. This approach ensures that the RSI uses all available information and provides the most up-to date estimates for recent periods.

More information on RSI revisions can be found in the RSI Revisions Policy[13].

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[12] http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/retail-sales/updated-accuracy-measures-for-the-retail-sales-index.pdf

[13] http://www.ons.gov.uk/ons/guide-method/revisions/revisions-policies-by-theme/economy/retail-sales-index-revisions-policy.pdf

13. Comparability with other retail sales indicators

There are other indictors of retail sales available. These include the British Retail Consortium's (BRC)[14] United Kingdom Retail Sales Monitor and the Confederation of British Industry's (CBI)[15] Distributive Trade's Survey. The data produced by both are regularly used along with the RSI as key indicators of retail sales growth. However, there are differences between the indicators in relation to coverage and compilation that can lead to discrepancies between published figures.

13.1 BRC United Kingdom Retail Sales Monitor (RSM)

The RSM is produced using data supplied by retailers from across the UK's retail industry. Sales values from a range of 12 product categories are provided weekly to KPMG[16] who then aggregate them into annual growth rates for each month on a total and like-for-like basis. The like-for-like figure strips out the effects of expansions and store openings and closures and is presented as a measure of retail industry performance. The total figure reflects retail industry growth. The headline growth rates are published in the second week after end of the month reported on.

From the Retail Sales Statistical Bulletin, the most appropriate measure to compare with the RSM total sales series is the RSI value of retail sales excluding automotive fuel for large stores, non-seasonally adjusted.

13.2 CBI Distributive Trade's Survey (DTS)

The DTS is a qualitative survey which looks to capture short and medium-term trends in the UK Retail Sector. On average 68 retailers, who account for approximately a third of total employment in the retail sector, respond to the survey. Respondents are required to answer a series of questions regarding sales volumes using a scale of up, down or same as last year.

14. Methods reviews and updates

The methodology used to produce retail sales statistics is reviewed periodically by the Methodology Directorate (MD) within ONS. In 2008 MD conducted a review of the methodology and systems used in the calculation of the RSI. The systems were all found to be working correctly. For the methodology recommendations were made regarding the chain-linking methodology planned for implementation on RSI in 2009. The main recommendations of this review were:

- Use CPIs for deflation rather than RPIs (which is closer to the requirement for a Laspeyres volume index)
- Using an annual benchmark derived from the RSI responses, and not one from the ABI (reduces revisions, and recognises difference in concept between RSI and ABI).
- Annual updating (and consequent revision) of deflation weights for the latest ABI (again closer to the requirement for a Laspeyres volume index).

These recommendations were implemented and are described in the paper "Changes to the retail sales methodology", McLaren, C. Economic and Labour Market Review, vol 3, no6[17].
The latest review of the RSI methodology was conducted through 2010 where a review of the methodology used for editing and validation was conducted. The result of this review was the implementation of selective editing as described in section 5.1. Also reviewed in 2010, were the weights used for annual chain-linking and the annual seasonal adjustment review which was conducted for the first time in X-12-ARIMA.

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[14] http://www.brc.org.uk/brc_home.asp

[15] www.cbi.org.uk/ndbs/staticpages.nsf/StaticPages/home.html/?OpenDocument

[16] rd.kpmg.co.uk/

[17] http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/retail-sales/changes-to-retail-sales-methodology.pdf

Seasonal adjustment reviews will continue to take place yearly and re-referencing of the chain volume indices will take place at the same time as the national accounts are re-referenced, that is when a consistent set of weights is available.

All other reviews of the RSI methodology will be discussed with users, for example at user engagement events where they will be given the opportunity to feed into the review and methodology changes. Any proposed changes will go through a consultation process and when made will be disseminated to users. This document will also be updated when a new review begins and when changes are made to the methodology.

Annexe 1

Retail sales index categories and their percentage weights in 2011

Publication category	Percentage of All retailing		RSI Aggregate	SIC**	Description
Predominantly food stores		41.3	Agg1		
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		1.28		47.72	Footwear and leather goods
Household goods stores		8.8	Agg7		
		3.07		47.52	Hardware, paints and glass
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		3.15		47.59	Furniture, lighting equipment and household articles not elsewhere classified
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	Pharmaceutical, medical, cosmetic & toilet articles	0.34		47.73	Dispensing chemists
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		0.83		47.75	Cosmetic and toilet articles
	Other retail sale in specialised stores	1.38	Agg32	47.41	Computers, peripheral units and software
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		0.47		47.53	Carpets, rugs, wall and floor coverings
		1.28	Agg35	47.61	Books
				47.62	Newspapers and stationery
		2.06	Agg33	47.64	Sporting equipment
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		1.12		47.76	Flowers, plants, seeds, fertilisers, pet animals and pet food
		1.48		47.77	Watches and jewellery
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* Based on aggregated annual data from the Retail Sales Inquiry, 2011.

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