Index of Services QMI

Contact:

ios.enquiries@ons.gsi.gov.uk

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Next release:
To be announced

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1 . Methodology background

National Statistic	
Survey name	
Frequency	Monthly
How compiled	Sales turnover from Monthly Business Survey (approximately 49%) and other survey and administrative sources (51%)
Geographic coverage	UK
Sample size	Monthly Business Survey: approximately 27,000
Last revised	26 January 2017

2 . Important points about Index of Services (IoS)

- The monthly IoS provides a timely indicator of growth in the output of the services industries, the largest industrial grouping in the UK economy, which accounts for approximately 80% of total output.
- The IoS shares exactly the same industry coverage as the corresponding quarterly series within UK gross domestic product (GDP).
- Sales turnover data is collected from the Monthly Business Survey (41%), along with data from a variety of administrative sources which are not based on random samples; therefore, we don’t publish a measure of sampling error associated with the IoS.
- Figures published in the IoS are subject to revision, an inevitable consequence of the trade-off between timeliness and accuracy, though revisions are typically small.
- The October 2016 IoS publication presents the average absolute revision over the last 60 months; for the 3 month on 3 month growth this was 0.16 and for the 1 month on 1 month growth rate this was 0.14.

3 . Overview of the output

The primary purpose of the Index of Services (IoS) is to produce a short-term measure of the output of the services industries within the UK economy. It is an important economic indicator and shows the monthly movements in gross value added (GVA) for the services industries. GVA is an important element in measuring the economy. GVA for the services industries is the difference between the value of a service provided (output) and the value of the goods and services used up in providing that service (intermediate consumption).

Overall, services industries account for around 80% of gross domestic product (GDP) and include private sector and government services. The 4 main components of the services industries are:

- distribution, hotels and restaurants
- transport, storage and communication
- business services and finance
- government and other services

The IoS output uses a wide variety of data from many sources and is calculated as a seasonally adjusted, chained volume index (linking volume growth between consecutive time periods). All of the data sources and methods used to compile the IoS are consistent with those used in the services industries element of the output (or production) approach to measuring GDP in the quarterly national accounts. The IoS estimates are disseminated via the ONS website in a statistical bulletin, corresponding datasets and time series dataset.

The IoS series was developed to provide a timely indicator of growth in the output of services industries for the UK. Between December 2000 and February 2007, the IoS was published as an Experimental series. In March 2007, in response to the significant methodological improvements made as part of the IoS Development Programme, the IoS was reclassified from Experimental to National Statistic status.

4 . Output quality

This page provides a range of information that describes the quality of the output and details any points that should be noted when using the output.

We have developed guidelines for measuring statistical quality; these are based upon the 5 European Statistical System (ESS) quality dimensions. This page addresses these quality dimensions and other important quality characteristics, which are:

- relevance
- timeliness and punctuality
- coherence and comparability
- accuracy
- output quality trade-offs
- assessment of user needs and perceptions
- accessibility and clarity

More information is provided about these quality dimensions in the following sections. About the output

Relevance

(The degree to which the statistical outputs meet users' needs.)

The primary purpose of the IoS is to produce a short-term measure of the output of the services industries within the UK economy and show the monthly movements in the gross value added of the services industries (2007 Standard Industrial Classification (SIC 2007) sections G to T). The 4 main components of the services industries are: distribution, hotels and restaurants (SIC 2007 sections G and I); transport, storage and communication (sections H and J); business services and finance (sections K to N); and government and other services (sections O to T). The IoS is the largest contributor to the output estimate of GDP. The index is estimated using the same data sources and national accounts methodology as the quarterly estimate of services industries' gross value added within the output approach to measuring GDP.

IoS statistics were assessed for compliance against the Code of Practice for Official Statistics with a report published in April 2014. This review confirmed the IoS's designation as a National Statistic. Designation can be interpreted to mean that the statistics: meet identified user needs; are produced, managed and disseminated to high standards; and are explained well.

Main external users of the IoS are: Bank of England (BoE); Her Majesty's Treasury (HMT); Department for Business, Energy and Industrial Strategy (BEIS); and Office for Budgetary Responsibility (OBR). Their primary use of the data is to inform decisions on fiscal and monetary policy and as such the monthly IoS statistics are essential for their briefing and forecasting purposes. User group meetings are held on a quarterly basis to address any issues with the data (including changes to methods) and to ensure that user needs and requirements are still met (for more information see the Assessment of user needs and perceptions section). The IoS is also used for analysing economic performance of the services sector. Other users include business and research communities, economic and financial organisations, the media and the general public.

The monthly IoS output estimates for the percentage change between: the most recent month on a year earlier; the most recent month on the previous month; the most recent 3 months on the same 3 months a year earlier; and the most recent 3 months on the previous 3 months. You are reminded of the volatility of some monthly estimates but the publication of these 4 measures is in line with user requirements.

Although the IoS is a monthly indicator, it is based on a range of data collected monthly, quarterly and annually from a range of different sources. Some of the indicators are derived using current price turnover data, including data from the Monthly Business Survey (MBS), which is an ONS short-term survey on different parts of the economy and is one of the main data sources used in the compilation of the IoS (approximately 50% of IoS data come from the MBS).

The data collected are sales turnover excluding Value Added Tax (VAT). These data are then deflated using suitable price indices, which were chosen due to their appropriateness for the various services industries, with weights primarily generated from the National Accounts Supply and Use Tables. Other indicators use direct volume measures that do not need to be deflated, such as the Civil Aviation Authority data for air transport. Some use other proxies, such as employment numbers from workforce jobs (WFJ) data. A comprehensive list of all data sources used in the compilation of the IoS, including current price and volume data and a detailed breakdown of the deflators, can be found in the source catalogue in the Index of Services Guidance and Methodology area of the ONS website.

As part of the GDP(O) Continuous Improvement Programme, an article was published on 14 November 2016 describing Changes to GDP(O) improvement programme. The changes have been agreed with the UK Statistics Authority and have been made in order to align the improvement programme more closely with our Economic Statistics Transformation Programme. In short, the programme of GDP(O) industry reviews has been superseded by a more holistic approach to improvements across national accounts as a whole.

To reflect the improvements seen in the GDP(O) Improvement report, along with updated weights, the GDP(O) source catalogue has been updated and was released alongside The Blue Book 2016 publication on 29 July 2016.

Additionally, we are developing a new approach for the use of microdata collected by Her Majesty's Revenue and Customs (HMRC) from Value Added Tax (VAT) returns. We aim to include VAT turnover estimates in processing components of quarterly gross domestic product (GDP) by the end of 2017. As part of this project, an article entitled VAT turnover, initial research analysis, UK: Jan 2014 to Mar 2016 was published on 4 October 2016; the sixth in a series of articles.

The next article will be published in early 2017 and we would welcome feedback on how we could potentially improve our methods and data. Please contact us with your views at vatdev@ons.gsi.gov.uk.

Timeliness and punctuality

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.)

The IoS is published on the ONS website around 8 weeks after the end of the reference month. The statistical bulletins are published on the same day as the preliminary estimate of GDP, the second estimate of GDP and the quarterly national accounts (when the IoS publishes data for one month ahead of the most recent GDP release).

As the monthly IoS is an important component in the development of a monthly GDP indicator, the timeliness of the data is a valuable strength (more information can be found in the Output quality trade-offs section). We are currently investigating bringing forward the IoS publication date and will keep users up-to-date on progress regarding this in the near future.

There are Eurostat requirements on the timeliness of quarterly national accounts (currently 45 days after the end of the reference period) but, as the majority of European countries do not produce a monthly IoS, there are, as yet, no requirements on the timeliness of a monthly IoS.

For more details on related releases, our release calendar provides 12 months' advance notice of release dates. If there are any changes to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the Code of Practice for Official Statistics.

5 . How the output is created

The IoS is designed to measure the change in the GVA of the services sector. GVA is the value of its gross (or total) output less any goods or services it has acquired from other industries or has imported. Conceptually, GVA for each industry should be estimated by revaluing both the gross outputs and the inputs; then subtracting the latter from the former, but in practice more information is available on outputs than on inputs so changes in gross output are predominantly used as an approximate indicator of changes in GVA, in the most recent periods.

A full description of the data sources and methodologies used to compile the IoS can be downloaded from the Index of Services Guidance and Methodology page of the ONS website.

Weighting

Each industry in the IoS is expressed as an index series and therefore to be able to compile higher level aggregates the industries are weighted together. This is done according to their relative contribution to total GDP, based on their GVA at a set point in time. In general, the larger the GVA for a particular industry the larger its relative contribution to total GDP and, as such, the higher the "weight" associated with that industry.

When producing the IoS, there are a number of different types of weights used to produce the estimates. The low level aggregation weights and low level deflation weights are updated every 5 years. The GVA weights (used to aggregate the 112 industries up to section, sector and whole economy level) are updated annually. Further information on the weights used in the IoS can be found in the Overview of Weights document and a full list of weights used in the calculation of the IoS can be found in the source catalogue in the Index of Services Guidance and Methodology area of the ONS website.

Time series

Where monthly estimates are not available (for example, when data are delivered with quarterly or annually periodicity), a monthly path is interpolated. Interpolation (sometimes referred to as temporal disaggregation) is the process of producing a time series at a higher frequency than is actually available, for example, a monthly series from quarterly data. There is a common need for this approach across national accounts, where the accounting framework demands inputs that are not available as frequently as required. For the IoS, this method is carried out using the X-13ARIMA-SEATS forecasting method where a monthly path is interpolated using a cubic spline.

An X-13ARIMA-SEATS forecast is also used where actual data are not available for the latest period (a lower proportion of actual data are available for the latest month, typically 44%). When the forecast is replaced by actual data, this may lead to revisions to the published data.

Statistical disclosure control

Statistical disclosure control methodology is also applied to the data. This ensures that information attributable to an individual organisation is not disclosed in any publication. The Code of Practice for Official Statistics, and specifically Principle 5: Confidentiality, sets out practices for how we protect data from being disclosed. The Principle includes a guarantee to survey respondents to “ensure that official statistics do not reveal the identity of an individual or organisation, or any private information relating to them”. More information can be found on the Government Statistical Service Statistical Disclosure Control Methodology page.

Relationship with national accounts

As stated previously in this report, all of the data sources and methods used to compile the IoS are consistent with those used in the services industries element of the output (or production) approach to measuring GDP in the quarterly national accounts. As the IoS conforms to the national accounts framework, it is also subject to the same revisions policy and quarterly and annual coherence adjustments as the output approach to measuring GDP. These adjustments are used to align the 3 measures of GDP.

It should be noted that the national accounts are estimates of an underlying reality based on statistical surveys, forecasts and models and are not compiled through “accounting” in the common sense of the word.

6 . Validation and quality assurance

Accuracy

(The degree of closeness between an estimate and the true value.)

There is no simple way of measuring the accuracy of the IoS, that is, the extent to which the estimate measures the underlying “true” value of the output growth (of the services industries) in the UK for a particular period. For many statistics, we are able to estimate and publish the sampling error associated with the estimate, using this as an indicator of accuracy. The IoS, however, is constructed from a wide variety of data sources, some of which are not based on random samples. As a result it has not yet been possible to measure the sampling error.

One dimension of measuring accuracy is reliability, which can be measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequent estimated values. Figures for the most recent months are provisional and subject to revision in light of:

- late responses to surveys and administrative sources
- forecasts being replaced by actual data
- revisions to seasonal adjustment factors, which are re-estimated every month and reviewed annually
- changes to the methodological processes used to gather and process the data
- annual GDP balancing

The results of revisions analysis are regularly presented in the IoS statistical bulletin. These, alongside revisions datasets containing the data behind this analysis, are available on the IoS page on the ONS website. It is important to note that there are other aspects to accuracy that revisions analysis cannot attempt to measure. A value can be reliable (as in not revised) without being accurate.

Further information is available in the Quality of the IoS report on the Index of Services Guidance and Methodology web page.

Quality assurance

To assess the quality of the published IoS, a series of quality assurance procedures have been put in place since the IoS began in December 2000. The purpose of these procedures is to understand and explain movements in the data, to allow quality adjustments to be made in an informed manner and to check that the computer system is calculating the published indices correctly. More information on the quality adjustments including the main causes, the criteria and how quality adjustments are applied can be found in the Quality Adjustments for the IoS report on the Index of Services Guidance and Methodology web page.

Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, geographic level.)

Every effort is made to ensure that the series is comparable over time, and a comparable time series is available back to 1997. Where possible, changes to methodology (for example, as a result of the IoS development programme) are applied to the whole series to ensure this comparability is maintained. However, the National Accounts revision policy may mean that there is a time lag before methodological changes are published for the complete time series.

International standards such as the UN System of National Accounts 2008 (2008 SNA) and European System of Accounts 2010 (ESA 10) are used in the production of the IoS and as such the figures should be directly comparable with the accounts of other countries (although the UK is one of only a few countries to produce a monthly IoS).

All of the data sources and methodologies used to compile the IoS are consistent with those used in the services industries' element of the output approach to measuring GDP. The IoS data are coherent with the quarterly service index published as part of the output approach to measuring GDP, so that the arithmetic mean of the 3 monthly indices is equal to the quarterly index.

Information on the compilation of GDP can be found in the Quality and Methodology Information report for GDP on the ONS website.

International comparison

International comparison with the IoS is difficult, as most comparable economies don't produce equivalent estimates. Eurostat turnover in services estimates are not comparable with the IoS, as they exclude the wholesale and retail trade; furthermore, most of the estimates are only available quarterly. The USA also produces services output estimates, but only on a quarterly basis, with a 4-month lag time. Japan has a direct equivalent of the IoS, but the estimates are not seasonally adjusted. The closest equivalent estimates are from Canada, which produces a monthly output estimate of GDP with a breakdown by industry (including an aggregate for services). There are also comparable quarterly estimates for some industries from Sweden and Ireland.

Retail sales and IoS

The retail component of the IoS uses retail sales data in its compilation, and as such, data are required from the Retail Sales production team within ONS. The data are then fed through into the gross value added (GVA) system.

Data for the retail industry published in the IoS release are broadly comparable with the data available in the latest Retail Sales publication but, as the 2 series operate under different revisions policies, there can be timing differences in the updating of the 2 series. Also, adjustments to the data within the IoS release are sometimes made at the time of the Blue Book to improve the coherence of the 3 approaches to measuring GDP. Therefore, inconsistencies between the 2 series are not unusual but tend to be small. There are also conceptual and coverage differences between retail sales and retail output which can lead to apparent inconsistencies.

7 . Concepts and definitions

(Concepts and definitions describe the legislation governing the output, and a description of the classifications used in the output.)

The IoS is based on the European System of Accounts 2010 (ESA 10), which in turn is based on the UN System of National Accounts 2008 (2008 SNA). The categories used for classifying industries in the IoS are the UK version of the latest international standard classification of industries, usually abbreviated to SIC 2007. Further guidance can be found in the Eurostat Price and Volume Handbook and the OECD compilation manual for Index of Service production.

Definitions of terms found within the main statistical bulletin are:

Index number

An index number is a number that indicates the change in magnitude relative to the magnitude at a specified point, the latter usually taken as 100. For example, if the level of services for a particular month is 110, this means that services output was 10% higher than the average in the reference period.

Seasonal adjustment

The data published in the IoS release are all seasonally adjusted. This aids interpretation by removing annually recurring fluctuations, for example, caused by holidays or other regular seasonal patterns. Regular variation includes effects due to month lengths, different activity near particular events such as shopping activity before Christmas and regular holidays such as the May bank holiday.

Some features of the calendar are not regular each year, but are predictable if we have enough data, for example, the number of certain days of the week in a month may have an effect, or the impact of the timing of Easter. As Easter changes between March and April we can estimate its effect on time series and allocate it between March and April depending on where Easter falls. Estimates of the effect of the day of the week and Easter are used respectively to make trading day and Easter adjustments prior to seasonal adjustment.

X-13ARIMA-SEATS is the current seasonal adjustment software used for the IoS.

Value (current price)

Economic transactions involve the production of goods and the sale of goods and services (commodities). The monetary value (or current price) of these transactions is a product of the quantity produced or sold and the unit price. In a particular period, the total (aggregate) value of all transactions taking place in the economy is simply the sum of the individual transaction values in that period.

Volume (constant price)

When it comes to comparing the difference in aggregate values between 2 time periods, the observed movement is generally a combination of changes in quantity and changes in price. In a lot of cases, the interest of users of economic data lies in understanding the degree to which economic growth is being driven by changes in quantities (that is, physical volumes of production and consumption). It is standard practice to present many economic statistics as volume series (showing changes in the level of the series that have not been affected by changes in price) and such series are referred to as “at constant prices”.

Deflation

The process of removing price changes from a value series and converting to a volume series is known as deflation. All index numbers presented in the IoS release are volume measures and have had the effect of price changes removed.

Chained volume measures

The services indices are presented as “chained volume” measures, meaning that successive volume estimates have been linked (or chained) together. Annual chain-linking was introduced in 2003 and is considered preferable to producing standard volume series, as chained volume measures more accurately reflect volume changes over time. More information on chain-linking can be found in The effects of annual chain-linking on the output measure of GDP (2001) (92.8 Kb Pdf) article.

Gross domestic product

Gross domestic product (GDP) is the primary indicator of economic activity within the UK. GDP can be estimated in real terms (adjusted to remove the effects of inflation) or nominal terms (unadjusted). In the UK, 3 different theoretical approaches are used to estimate GDP:

- GDP from the output or production approach – GDP(O) measures the sum of the value added created through the production of goods and services within the economy (our production or output as an economy); this approach provides the first estimate of GDP and can be used to show how much different industries (for example, agriculture) contribute within the economy

- GDP from the income approach – GDP(I) measures the total income generated by the production of goods and services within the economy; the figures provided break down this income into, for example, income earned by companies (corporations), employees and the self-employed

- GDP from the expenditure approach – GDP(E) measures the total expenditures on all finished goods and services produced within the economy

In theory, the 3 different approaches should produce the same result. However, as they are based on different surveys and administrative data sources, a balanced GDP estimate can only emerge after a process of balancing and adjustment.

8 . Other information

Output quality trade-offs

(Trade-offs are the extent to which different dimensions of quality are balanced against each other.)

As previously stated in this report, the IoS is published on the ONS website around 8 weeks after the end of the reference month. As the IoS is an important component in the compilation of the GDP indicator, the timeliness of the data is crucial, but there is a trade-off between accuracy and timeliness. Provisional outputs are timelier, but expectations of accuracy and reliability in early estimates are often too high as early estimates are based on incomplete data. Revisions are an inevitable consequence of the trade-off between timeliness and accuracy. More information on revisions can be found in the Accuracy section.

Assessment of user needs and perceptions

(The processes for finding out about uses and users, and their views on the statistical products.)

From January 2017, we improved the format and structure of the Index of Services statistical bulletin, which means it will be shorter and more insightful. Your feedback is welcomed via email to the IoS inbox ios.enquiries@ons.gsi.gov.uk.

In addition to a quarterly national accounts stakeholder group, meetings are held with BoE, HMT, BEIS and OBR to address any issues with the data. Upcoming user events and seminars are advertised in the IoS statistical bulletin. Engagement across all of our economic statistics is also provided via a range of economic forum events.

9 . Sources for further information or advice

Accessibility and clarity

(Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations and accompanying advice.)

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel. The ONS website also offers users the option to download the narrative in PDF format. In some instances other software may be used, or may be available on request. Available formats for content published on the ONS website but not produced by us, or referenced on the ONS website but stored elsewhere, may vary.

A recent announcement was made that government departments should move to open standards for documents. Future business plans will incorporate the adoption of these standards where appropriate. For further information please refer to the contact details at the beginning of this document. For information regarding conditions of access to data, please refer to:

- terms and conditions (for data on the website)
- accessibility

In addition to this Quality and Methodology Information, quality information relevant to each release is available in the IoS statistical bulletin.