

# Information paper

## Quality and Methodology Information

### General Details

Title of output:	Monthly Business Survey
Abbreviated title:	MBS
Designation:	National Statistic
Geographic Coverage:	UK (production industries), Great Britain (service industries)
Date of last SQR or QMI <sup>1</sup> :	July 2010
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### Executive Summary

The Monthly Business Survey (MBS) collects turnover, new orders and employment information from UK businesses in production industries and Great Britain businesses in services industries. Monthly turnover results give an early indication of what is happening in the economy and contribute to a number of important economic measures, including the Output measure of Gross Domestic Product (GDP(O)), the Index of Production (IoP) and the Index of Services (IoS). Employment information is collected via the MBS on a quarterly basis to feed into other ONS publications such as the Labour Market Statistical Bulletin, Workforce Jobs and the Economic and Labour Market Review. Workforce Jobs will be covered by a separate quality report.

This report relates mainly to current price, unadjusted turnover statistics produced by the MBS and published in the Turnover and Orders in Production and Services Industries (TOPSI) release. Figures are collected from sampled companies and industry estimates are calculated using known information about the sample compared to the population. See 'How the Output is Created' for more information. Industry estimates are aggregated up to a suitable level for publication in TOPSI.

TOPSI data are published on the National Statistics website every month in the form of downloadable reference tables. A time series dataset is also available.

This document contains the following sections:

- Output quality
- About the output
- How the output is created
- Validation and quality assurance
- Concepts and definitions
- Other information, relating to quality trade-offs and user needs
- Sources for further information or advice.

### Output Quality

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

ONS has developed [Guidelines for Measuring Statistical Quality](#); these are based upon the European Statistical System (ESS) quality dimensions. This document addresses the quality dimensions and important quality characteristics, which are:

- Relevance
- Timeliness and Punctuality
- Comparability
- Coherence
- Accuracy

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<sup>1</sup> Quality and Methodology Information' (QMI) replaced 'Summary Quality Reports' (SQR) from 04/11

- Output Quality Trade-Offs
- Assessment of User Needs and Perceptions
- Accessibility and Clarity

More information about these quality dimensions is provided in the sections below.

## About the Output

### Relevance

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

<b>What It Measures</b>	Turnover, export turnover, new orders, export new orders, number of employees.
<b>Frequency</b>	Monthly (Quarterly for number of employees).
<b>Sample Size</b>	Approximately 30,000.
<b>Period Available</b>	1998 (production), 2001 (services) to present period.
<b>Sample Frame</b>	The Inter Departmental Business Register (IDBR).
<b>Sample Design</b>	Stratified simple random sampling, but complete enumeration (returns are collected for every unit in the population) of businesses above an industry-specific employment threshold considered 'large'.
<b>Weighting</b>	In strata without complete enumeration, each business represents a number of similar businesses in the stratum population. Strata are based on the employment of the business and the <a href="#">Standard Industrial Classification 2007</a> . Weights are updated monthly to reflect changes in the business population.
<b>Estimation</b>	Estimation uses the ratio between the survey variable (turnover) and an auxiliary variable (annual register turnover) which is available for the complete population to make estimates for non-sampled units. Each sampled industry uses either combined ratio estimation or stratum specific separate ratio estimation. Use of ratio estimation increases the precision of the estimates.
<b>Imputation</b>	Imputation is used in cases of non-response and should reduce any potential bias. A link factor is calculated based on the average movement of returned data for similar companies, and applied to previous returns for each non-responder. A construction ratio is calculated by industry using the average proportion of each returned turnover figure to that company's annual register turnover. For each never-responding business, this ratio is then applied to their register turnover to obtain a constructed value. For subsequent periods, imputed values will be based on movements in businesses in the same industry.
<b>Outliers</b>	Outliers are detected automatically and treated by Winsorisation, thereby reducing the outliers' impact on the overall estimate. Winsorisation is a method of dealing with extreme values by limiting them to a statistical boundary within the dataset; the use of this automatic process here is consistent with other ONS business surveys.
<b>Forecasting</b>	None.

The main users of turnover data from the MBS are the Index of Production (IoP) and the Index of Services (IoS) directly, which both feed into the quarterly Output measure of the Gross Domestic Product (GDP(O)). These measures are widely used by the Bank of England and HM Treasury to monitor and forecast economic growth and to inform vital policy decisions. They are also used by various Trade Associations when making international comparisons.

Another important user of data from the MBS is Eurostat for their [Principal European Economic Indicators](#). Data from the MBS are supplied for Eurostat publications relating to Industrial New Orders, Industrial Production, Industrial Turnover and Other Services Turnover. The supply and use of these data are governed by European Regulations. Other known users of the MBS output include the Scottish Government and the Welsh Government as well as the Department of Businesses, Innovation and Skills.

All of the above direct or indirect users require MBS data to feed into similar measures and/or publications of their own. They will often combine MBS data with other sources within and outside of ONS to cover all sectors of the economy (for example by including Retail, Financial and

Construction). Data collected from the production sector have UK coverage but data collected from the services sector cover Great Britain (does not include Northern Ireland).

### **Timeliness and Punctuality**

Timeliness refers to the lapsed time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.

The MBS data collection closes down on the 18th working day of the calendar month following the reference period of the survey. Initial estimates are passed to direct customers (the IoP and the IoS) on the 19th working day. Following quality assurance of additional variables publication of these data in the Turnover and Orders in Production and Services Industries (TOPSI) takes place on or before one month and 20 days after the reference period of the survey; for example the January 2011 publication was released on the 18th March 2011. TOPSI consistently meets publication deadlines. In the latest reviews of the predecessors the Monthly Production Inquiry (MPI) and the Monthly Inquiry into Distribution and Service Sectors (MIDSS) surveys, 88% of users agreed that data were released in time for their needs.

For more details on related releases, the [UK National Statistics Publication Hub](#) is available online and 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](#).

## **How the Output is Created**

### **Coverage and sample**

There are 144 industrial strata in the MBS sample, as defined by the Standard Industrial Classification (2007). Turnover is collected for 143 industries, the other is Water Treatment and Supply for which the volume of water is collected in megalitres. Eight of these industries were introduced from July 2010 and are currently considered experimental, they are listed under 'Concepts and Definitions'. Collected industries are aggregated into 69 groups for publishing (excluding the eight experimental series which are currently not published). All of these industries receive extra employment questions once a quarter (in March, June, September and December reference periods). Forty-three industrial groups receive questions on new orders to fulfil the Eurostat Short Term Statistics (STS) Regulation. A total of approximately 365,300 questionnaires were sent out in 2010. The combined production and services sample for MBS in January 2011 was 30,300. The sampling frame used is the Inter-Departmental Business Register. Businesses employment recorded on the register is used as the basis for stratification, with complete enumeration for businesses with employment exceeding an industry-specific threshold. A random sample is selected for each of the other strata.

The data collection method used for the majority of businesses is an automated Telephone Data Entry system (TDE). Businesses return their data to ONS using key presses on a telephone rather than returning a paper questionnaire. Some businesses are still asked (or prefer) to return the paper questionnaire in the pre-paid envelope provided.

### **Weighting and estimation**

As it is not feasible to survey every business in the population it is necessary to weight the data to provide estimates for the full population. In strata that are not fully enumerated two weights are applied:

1. 'Design' weight also known as the 'a' weight. This takes into account the ratio of the size of a sample to the size of the population from which the sample is selected.
2. 'Calibration' weight also known as the 'g' weight. This takes into account how representative a sample's register turnover is compared to the register turnover of the population from which the sample is selected.

The MBS uses a mix of separate and combined ratio estimation for each specific industry. In combined ratio estimation, a common weight is applied to all sampled businesses in an industry irrespective of its employment strata. In separate ratio estimation a weight is calculated for each employment stratum. A third weight incorporates a Winsorisation of outliers and is applied to all data returns.

## Imputation

Imputation is used in cases of non-response and should reduce any potential bias. A link factor is calculated based on the average movement of returned data for similar companies, and applied to previous returns for each non-responder.

A construction ratio is calculated by industry using the average proportion of each returned turnover figure to that company's annual register turnover. For each never-responding business, this ratio is then applied to their register turnover to obtain a constructed value. For subsequent periods, imputed values will be based on movements in businesses in the same industry.

## Disclosure

Statistical disclosure control methodology is applied to the MBS data. This ensures that information attributable to an individual or individual organisation is not identifiable in any published outputs. The [Code of Practice for Official Statistics](#) and specifically the Principle on Confidentiality set out practices for how we protect data from being disclosed. The Principle includes the statement that ONS outputs should "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". More information can be found on [Confidentiality of data collected for statistical purposes](#) and also on [Statistical disclosure control](#) on the ONS website.

## Validation and Quality Assurance

### Accuracy

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

Estimates from the MBS are subject to various sources of error that can be categorised into sampling and non-sampling error.

**Sampling error** occurs because estimates are based on a sample rather than a census. Sampling error of the MBS is measured internally at the point where results are made final and are passed to direct customers. For the monthly turnover estimate for the whole of the MBS, coefficients of variation around 1.0 - 2.0% are usual. Coefficients of variation are calculated both at the sampled level of industry that is passed to customers and at the aggregated level of industry that is published in TOPSI. High coefficients of variation are rare but are always investigated at the individual business level to determine the cause. Coefficients of variation will in future, be published as part of the MBS Basic Quality Information (BQI) document, following a review of their production.

**Non-sampling errors** are not easy to quantify and include errors of coverage, measurement, processing and non-response. Various procedures are in place to ensure errors are minimised. Validation checks on data, for example percentage movements from month to month, are carried out to highlight unusual changes in turnover data. Disparities are investigated by contacting the business for clarification if necessary. Monthly target response rates for the MBS are as follows: for the production industries, 75% by number of questionnaires and 85% by register turnover; for the services industries, 75% by number of questionnaires and 80% by register turnover. The MBS regularly exceeds these monthly targets.

Another common cause of error is where a turnover value has been expressed in incorrect units (pounds rather than thousand pounds) and this has not been picked up during the data validation stage. Such errors are corrected and taken on as revisions during the next period, but if significant enough can be manually corrected in customers' data.

Editing rates give an indication of the cleaning applied to the data. Editing refers to the action of changing business level data either automatically, in the case of systematic errors, or after contacting the business to clarify suspect values.

**Reliability.** Assessing the difference between the first published estimate and the final revised figure provides an indication of reliability. The MBS revises unadjusted data for up to twelve previous periods by taking on late responses or cases where a business revises its own return. The underlying theory of revising twelve previous periods is the possible need to revise the previous year if, when querying a year on year movement, the business realises that all last year's returns were incorrect. Revisions are monitored on a monthly basis. The TOPSI publication includes revised industry totals for the twelve previous periods and indicates the earliest period revised. More information on MBS revisions will be published in the planned BQI (see above).

## Comparability and Coherence

Comparability is the degree to which data can be compared over time. Coherence is how similar figures are to data from different sources or methods that refer to the same topic.

The MBS commenced in January 2010 and is based on the [Standard Industrial Classification 2007](#). The previous surveys, MIDSS and MPI, were based on SIC 2003. To create a comparable time series for users, data from the two previous surveys were combined and converted from SIC 2003 to SIC 2007. Two methods of conversion were used for different parts of the series. Estimates from 1998 to 2008 were converted via a conversion matrix that measured the proportion by register turnover of industry groupings moving from SIC 2003 to SIC 2007. During 2009, a micro method was employed whereby a SIC 2003 sample was used to produce estimates in SIC 2007 domains by applying alternative weights to unit level data. Domain estimation can be considered a more accurate method of conversion, hence the 1998-2008 series was adjusted via link factors to match the level of 2009, if different. These adjustments were not substantial and were industry-specific. Users can consider the entire back series as comparable. A discontinuity may arise between December 2009 and January 2010, but this would be industry-specific and confounded by an annual update to the ONS Inter-Departmental Business Register. For these reasons plus a current lack of new post-January 2010 data on which to base an adjustment, no further amendments have been made.

The MBS adheres to agreed standards and definitions that ensure the data are comparable with other data within ONS, throughout Europe and the rest of the world. For example, the concept of economic status and industry is comparable with many ONS economic indicators that follow the Standard Industrial Classification structure. In turn the SIC structure is equivalent to Europe's classification structure for economic activity (NACE).

The TOPSI publication continues to follow the revisions policy of taking on late data or amendments for the previous twelve periods. This policy is comparable with the previous surveys that have been combined to produce the back series. Users should note the following historical changes to the collection of industries over time:

- the series do not begin at the same point in time for all services industries because of a gradual move from quarterly collection of data to monthly. Starting points are 1998, 2000 or 2001.
- SIC 2003 classes 80.3 'Higher Education' and 80.4 'Other Education' were discontinued in April 2002 but were reinstated in October 2004. These industries feed into SIC 2007 Division 85.
- collection of turnover for the Manufacturing of Motor Vehicles industry (SIC 2003 class 34.1, SIC 2007 class 29.1) commenced in May 2007, prior to this the time series has been extrapolated.
- collection of new orders for the production industries commenced in April 2003, prior to this the time series has been extrapolated.

The Annual Business Survey (ABS) compiles annual turnover data across the economy which includes annual data from production and services sectors. Comparisons can be made between this and the MBS but differences should be noted; for example MBS could aggregate annual data over twelve months of a year to arrive at an annual figure but the Annual Business Survey reports for fiscal periods which may or may not match. There are also some differences in SIC coverage.

## Production

The ABS covers sections B to E with no gaps, but the MBS excludes some industries as stated in section 2.1 Relevance. The MBS does not cover section D (Electricity, Gas, Steam and Air Conditioning Supply). See link above for more information on industry classifications.

## Services

The ABS covers sections G-J, L-N, P, R and S with no gaps, but the MBS excludes several industries as stated in section 2.1 Relevance. The ABS covers section Q excluding medical and dental practices. However the MBS covers medical and dental practices but does not cover residential care or social work services.

## Concepts and Definitions

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

For the purposes of fulfilling the Eurostat Short-term business Statistics (STS) Regulation, services turnover is uplifted to a UK level by applying proportional factors benchmarked against the Annual Business Survey. In relation to the expected uses of the MBS output, users should be aware of the [gaps in data collection coverage](#). Direct users of MBS turnover ([Index of Production](#), [Index of](#)



Services) use reflatd (adjusted using current price factors to provide estimated turnover levels) volume measures and other sources to fill in the following [SIC](#) gaps for turnover:

- section B: 05, 06, 09
- section C: 10.4, 10.6, 19, 24.1-32
- all of section D (35)
- section G: 47
- section H: 49.1-2, 50, 51, 53.1
- all of section K (64-66)
- section L: 68.1-2
- section M: 70.1
- section N: 81.1, 81.3
- all of section O (64)
- section P: 85.1-31
- section Q: 87, 88
- section R: 92
- section S: 94, 96.04-09

The coverage of the MBS was extended in July 2010 to collect turnover for the following SIC(2007) industries:

- real estate activities, 68.3
- veterinary activities, 75
- general medical practices; dental practices, 86.21/23
- specialist medical practices, 86.22
- other human health activities, 86.9
- libraries, archives, museums and other cultural activities, 91
- sports activities, 93.1
- amusement and recreation activities, 93.2

The turnover estimates produced for these industries are experimental and are not yet used in outputs.

MBS questionnaires collect data relating to the following concepts:

**Total turnover** is defined as the amount received by the business for services provided or goods sold during the period covered by the questionnaire. Turnover excludes VAT.

**Export turnover** is defined as the portion of total turnover that relates to the export market, which is anywhere outside of the UK.

**Total new orders** is the sum of all the orders a business has received during the reference period covered by the questionnaire.

**Export new orders** is defined as the portion of total new orders received that relate to the export market, which is anywhere outside of the UK.

**Employment** is defined as the number of employees within a business on a specific date of the reference period. An employee is anyone aged 16 years or over that the business pays directly from its payroll in return for carrying out a full-time or part-time job or being on a training scheme. This excludes agency workers.

Collection of the MBS data from January 2010 onwards is based on the latest definition of the Standard Industrial Classification (SIC 2007). The same classification is used across the EU and impacts on a wide range of statistics produced by the ONS. Section 2.5 Comparability details the construction of a comparable time series prior to January 2010. An information paper [‘Changes to the survey outputs from MBS \(formerly ETOD and DST\)’](#) provides further details regarding the introduction of the MBS in January 2010 along with the methodology of preparing statistics based on SIC 2007. This change in classification has increased the quality of the output because the industries now mirror the latest snapshot of the economy. Some industries are more accurately split with new distinctions between repair activities and manufacture activities. Other industries have moved sectors ie ‘Sale of Automotive Fuel’, Publishing’, ‘Repair of Personal and Household Goods’ and ‘Sewerage & Waste Disposal’. The refreshed sample structure and design reflect these latest economic trends.

## Other Information

### Output Quality Trade-Offs

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

Initial estimates are passed to primary internal customers on the 18<sup>th</sup> working day of the month following the reference period. With a few quality improvements, the same estimates are published at a higher level of aggregation on or by the 20<sup>th</sup> day of the following month in the TOPSI publication. The MBS revises unadjusted data for twelve previous periods by taking on late responses or cases where a business revises its own return. See the Reliability section for more information on revisions. There is a small trade-off between the timeliness of the first estimate and the future revisions caused by late return or corrected data.

### Assessment of User Needs and Perceptions

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

Main users are noted under 'About the Output'. The primary users of the MBS are internal (IoP and IoS) and review meetings are held on a monthly basis. As a relatively new survey, there has been no user satisfaction assessment carried out on MBS yet. External users are encouraged to contact us using information available on each data release of the TOPSI publication.

## 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.

ONS's recommended format for accessible content is a combination of HTML webpages 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. 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 the links below:

- Terms and conditions (for data on the website):  
<http://www.ons.gov.uk/ons/site-information/information/terms-and-conditions/index.html>
- Copyright and reuse of published data:  
<http://www.ons.gov.uk/ons/site-information/information/creative-commons-license/index.html>
- Pre-release access (including conditions of access):  
<http://www.ons.gov.uk/ons/guide-method/the-national-statistics-standard/code-of-practice/compliance/index.html>
- Access to unpublished data:  
<http://www.ons.gov.uk/ons/about-ons/who-we-are/services/unpublished-data/index.html>
- Access to microdata via the Virtual Microdata Laboratory:  
<http://www.ons.gov.uk/ons/about-ons/who-we-are/services/vml/index.html>
- Accessibility:  
<http://www.ons.gov.uk/ons/site-information/information/accessibility/index.html>

### Useful Links

Monthly Business Survey at a glance

<http://www.ons.gov.uk/ons/about-ons/surveys/a-z-of-surveys/monthly-business-survey--production-and-services-/index.html>

List of Turnover and Orders in Production and Services Industries releases

<http://www.ons.gov.uk/ons/publications/all-releases.html?definition=tcm%3A77-29794>

### References

Title of Reference	Website Location
Statistical Quality	<a href="http://www.ons.gov.uk/ons/guide-method/method-quality/quality/index.html">http://www.ons.gov.uk/ons/guide-method/method-quality/quality/index.html</a>
Index of Production Overview	<a href="http://www.ons.gov.uk/ons/rel/iop/index-of-production/index-of-production-overview/index.html">http://www.ons.gov.uk/ons/rel/iop/index-of-production/index-of-production-overview/index.html</a>

Index of Services methodology guide	<a href="http://www.ons.gov.uk/ons/guide-method/user-guidance/index-of-services-methodology/index.html">http://www.ons.gov.uk/ons/guide-method/user-guidance/index-of-services-methodology/index.html</a>
Principal European Economic Indicators	<a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/euroindicators/peeis/">http://epp.eurostat.ec.europa.eu/portal/page/portal/euroindicators/peeis/</a>
Information paper 'Changes to the survey outputs from MBS (formerly ETOD and DST)'	<a href="http://www.ons.gov.uk/ons/rel/iop/turnover-orders--prod/march-2010/turnover-and-orders-in-production-and-services-industries---changes-to-the-survey-outputs-from-mbs--formerly-etod-and-dst-.pdf">http://www.ons.gov.uk/ons/rel/iop/turnover-orders--prod/march-2010/turnover-and-orders-in-production-and-services-industries---changes-to-the-survey-outputs-from-mbs--formerly-etod-and-dst-.pdf</a>
UK National Statistics Publication Hub	<a href="http://www.statistics.gov.uk/hub/release-calendar/index.html">http://www.statistics.gov.uk/hub/release-calendar/index.html</a>
Code of Practice for Official Statistics	<a href="http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html">http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html</a>
Confidentiality of Official Statistics	<a href="http://www.ons.gov.uk/ons/guide-method/method-quality/quality/the-work-of-the-ons-quality-centre/risk-management/confidentiality-of-data-collected-for-statistical-purposes/index.html">http://www.ons.gov.uk/ons/guide-method/method-quality/quality/the-work-of-the-ons-quality-centre/risk-management/confidentiality-of-data-collected-for-statistical-purposes/index.html</a>
Statistical Disclosure Control Methodology	<a href="http://www.ons.gov.uk/ons/guide-method/method-quality/general-methodology/statistical-disclosure-control/index.html">http://www.ons.gov.uk/ons/guide-method/method-quality/general-methodology/statistical-disclosure-control/index.html</a>