

Information paper

Quality and Methodology Information

General details

Title of output:	Survey into Business Spending on Capital Items
Abbreviated title:	Business Spend
Designation:	National Statistics
Geographic Coverage:	UK
Date of last QMI*:	Nov 2009
Contact details:	abs@ons.gov.uk

Executive summary

This report is part of a rolling programme of quality reports being introduced by the Office for National Statistics (ONS). The full programme of work being carried out on [Statistical Quality](#)¹ is available on the ONS website. Quality and Methodology Information Reports are overview notes which pull together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output.

This report relates to the estimates of capital expenditure collected by the Survey into Business Spending on Capital Items (Business Spend) and aims to provide users with information on usability and fitness for purpose of these estimates. Business Spend collects information on the acquisition and disposal of capital assets.

Capital expenditure is more difficult to measure than many other variables in sample surveys. There are two main reasons for this. Firstly, capital expenditure can be sporadic, being quite large in one period and zero in others. This makes validation more difficult, as well as imputation for non responders. Secondly, significant capital expenditure can be undertaken by new businesses before they start normal trading. Important examples of this would include new manufacturing plants set up in the UK by overseas businesses, as well as new special project vehicles established to run [Private Finance Initiatives \(PFIs\)](#)².

Business Spend is a small survey consisting of a sample of 2,500 businesses covering most sectors of the economy. It is one of the measures introduced by ONS to monitor spending on capital items in more detail than other surveys allow (see table 3.1), and to improve the quality of official statistics as part of the Departmental Spending Review (DSR) package of surveys (agreed in 1998/9). Business Spend began as a pilot in 1999 for data year 1998.

Terminology, concepts and methods used in capital expenditure can be found in the UK [National Accounts: Concepts, Sources and Methods](#)³.

Capital assets (or fixed assets) are tangible or intangible assets produced as outputs from processes of production that are themselves used repeatedly, or continuously, in processes of production for more than one year.

* Quality and Methodology Information' (QMI) replaced 'Summary Quality Reports' (SQR) from 04/11

Survey into Business Spending on Capital Items	
What it measures	The value of capital assets bought and sold. Acquisitions and disposals of vehicles, other capital equipment, and computer hardware. Acquisitions of new building work (excluding dwellings), or other (construction) work of a capital nature, and computer software
Frequency	Annual
Sample size	Approximately 2,500
Sample frame	Inter Departmental Business Register (IDBR)
Sample design	Stratified random sample where the strata are defined by Standard Industrial Classification 2007 (SIC 2007) and employment size-band. For the majority of industries, all businesses with an employment of 2,000 or above are selected, along with a random sample of businesses with employment between 100 and 1,999. For the remaining industries, the census threshold ranges from 500 to 4,000 employment with random sampling taking place below the threshold. Businesses with less than 100 employment are not sampled.
Weighting	Each business is weighted up to represent a number of similar businesses, based on number of employees and SIC (currently SIC2007)
Estimation	Ratio estimation for both non-selected and non-respondent businesses
Imputation	There is no imputation in this survey
Outliers	Businesses with extreme or atypical key variable returns for their business size are automatically identified and treated using Winsorisation

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; and
- 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](#)⁴; these are based upon the five European Statistical System (ESS) quality dimensions. This document 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; and
- Accessibility and clarity.

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

About the output

Relevance

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

The main data user of Business Spend is Capital Branch of National Accounts Economic Statistics which uses these data to improve the estimate of Gross Domestic Product (GDP). The estimates provide a breakdown of capital expenditure to a more detailed product level. Data from the [Quarterly](#)

[Survey of Capital Expenditure \(Capex\)](#)⁵ and the [Annual Business Survey \(ABS\)](#)⁶ are broken down using Business Spend estimates to allow for more accurate deflation, seasonal adjustment and supply-use balancing. There is no alternative data source that can be used to produce the consistent and coherent detail required. The results of balanced [Supply and Use Tables \(SUTs\)](#)⁷ is a single annual estimate. The Business Spend also provides essential information used to create deflators.

The survey covers capital expenditure for manufacturing, other production, construction, distribution and services for the private sector. It does not cover agriculture, fishing and forestry (except for agricultural contractors), banking and various financial institutions, higher education establishments, new building work related to dwellings, and land and existing buildings. These data are obtained by ONS from other sources, for example Department of Business, Innovation and Skills.

Capital expenditure and the [UK National Accounts](#)⁸ are compiled in accordance with the [European System of Accounts 1995 \(ESA95\)](#)⁹, under EU law. [ESA95](#)⁹ is itself consistent with the standards set out in the [United Nation, System of National Accounts 1993 \(SNA 93\)](#)¹⁰. At the industry level results are currently classified by [SIC \(2007\)](#)¹¹.

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.)

Results from the survey are published in [Business Spend](#)¹² at the end of February as an ONS website release. Tables 1 to 5 show the results by main industry group. Tables 6 to 10 give the results at greater industry detail. Data collected are published within just over one year of the survey reference period eg, data for 2011 are published in February 2013.

For more details on related releases, the [UK National Statistics Publication Hub](#)¹³ 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](#)¹⁴.

How the output is created

Coverage

The Business Spend estimates cover businesses in Great Britain registered for Value Added Tax and/or Pay As You Earn and are classified using [SIC \(2007\)](#)¹¹.

The survey covers businesses in the private sector despatched to addresses in Great Britain only. The survey covers production, construction, distribution, and most service industries including agricultural service activities in Great Britain. The full list of SICs covered is given in the following table:

Industry	SIC (2007)
Other Production	1.61, 16.3, 5.1 - 9,9, 36 - 39
Manufacturing	15 - 37
Construction	41 - 43
Distribution Services	45 - 53
Other Services (for exclusions see below)	55 – 96

Industries not covered are:

- agriculture, hunting, forestry and fishing;
- financial businesses (except building societies);
- public administration; and
- defence and compulsory social security.

Data collection

All respondents, regardless of their employment size, receive the same questionnaire. They are asked to provide figures for a calendar year, or the nearest 12 month period for which figures are available.

The survey collects detailed breakdowns of two assets; vehicles, and other capital expenditure. Acquisitions and disposals of both categories are collected plus acquisitions of services, and intangible produced assets. Lags in payments are the difference between the time capital goods are ordered and the time they are received. This information is used in the deflation process by National Accounts.

Table showing asset and item breakdown:

Asset type	Items
Vehicles	<ul style="list-style-type: none"> - New cars - Second hand cars - Motor vehicles (for the transport of 10 or more people) - Goods vehicles (include vans, lorries, road tractors for semi-trailers) - Special purpose motor vehicles (includes crane lorries, golf carts, dumpers for off highway use and other special purpose motor vehicles) - Trailers and semi-trailers
New Construction Work (Acquisitions only)	N/A (not broken down further)
Services	<ul style="list-style-type: none"> - Computer services - Business consultancy - Architectural and engineering services - Construction services - Other services total
Intangibles	<ul style="list-style-type: none"> - Value of computer software - Entertainment/literary and artistic originals
Other Capital Expenditure	<ul style="list-style-type: none"> - Textiles and soft furnishings - Plastic products - Glass products - Ceramic goods (other than for construction purposes) - Metal structures and part of structures - Metal containers, tanks and reservoirs of capacity exceeding 300 litres - Steam generators (except central heating hot water boilers) - Cutlery/tools and general hardware - Other fabricated metal products - Machinery and equipment for the production and use of mechanical power excluding aircraft/vehicle and cycle engines - Furnaces and furnace burners - Lifting and handling equipment - Machine tools and portable hand-held power tools

Other Capital Expenditure (cont)	<ul style="list-style-type: none"> - Non-domestic cooling and ventilation equipment - Other general purpose machinery not elsewhere classified - Agricultural and forestry machinery - Machinery for metallurgy - Machinery for mining, quarrying and construction - Machinery for food, beverage and tobacco pressing - Machinery for textile, apparel and leather production (inc sewing machines) - Machinery for paper and paperboard production - Other special purpose machinery - Domestic appliances - Office machinery - Computers and other information processing equipment - Electric motors, generators and transformers excluding vehicle generators and diode valves - Lighting equipment including arc lamp and radio lighting - Other electrical equipment - Television/radio transmitters and apparatus for line telephony – including CCTV - Television and radio receivers, sound or video recording or reproducing apparatus and associated goods - Medical and surgical equipment and orthopaedic appliances - Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment - Industrial process control equipment - Optical instruments and photographic equipment - Furniture, including office and shop furniture, fixtures and fittings - Total of other capital expenditure items not listed above
Lags in payments	N/A (not broken down further)

Sample design

The Business Spend sample is approximately 2,500 businesses with the IDBR used as the sampling frame. Stratification of the survey is by industrial classification (a single SIC code or groups of SIC codes) and employment size band.

All businesses with an employment of 2,000 or above are selected, along with a random sample of businesses with employment between 100 and 1,999. For the remaining industries, the census threshold ranges from 500 to 4,000 employment with random sampling taking place below the threshold. Businesses with less than 100 employment are not sampled.

The sample is allocated in cells using optimal Neyman allocation to minimise the variance of the total capital expenditure estimator. A minimum cell size is imposed and small alterations are made based on other evidence.

Ratio estimation is used, with IDBR employment as the auxiliary variable. The weights are adjusted to account for the non-sampled businesses. Generally, once it is selected, a business will remain in the sample for two years before being rotated out.

Survey procedures

Questionnaires are despatched at the beginning of February, requesting a response by 1st April or within two months of the respondents' business year-end. Questionnaires are addressed to a named contact within the business wherever possible. Up to two written reminders can be sent.

Completed questionnaires are scanned centrally by the ONS Survey Processing Centre with Optical Character Recognition used to create an image. Images are stored on the computer system, reducing paper handling, retrieval and storage. Due to confidentiality issues, paper versions are shredded and recycled.

Once the data are placed onto the system, a series of credibility checks are applied to aid data validation. Staff in the Editing and Validation Branch examine the failed validation checks and use their expertise to determine whether the respondent needs to be re-contacted to query data.

Ratio estimation is used for the sampled band, with the auxiliary variable being IDBR employment. The census band includes all businesses in a given industry with employment above a certain threshold - this threshold is usually 2,000 employment, although this changes depending on the industry in question.

The sampled band contains all businesses in the rotational sample. Weighting is used to compile population aggregates for this sample, including the population below the lowest cut-off. Non responders and businesses that fall below the selection cut-off are estimated by producing a capital expenditure per head value based on the sampled and returned data.

Businesses that have capital expenditure which is atypical or extreme are treated as outliers. An automatic method called one sided [Winsorisation](#)¹⁵ is used to detect and treat outliers. The Winsorisation threshold is set to (approximately) minimise mean squared error and means that outliers have their values reduced towards the threshold.

Statistical disclosure control

Statistical disclosure control methodology is also applied to data. This ensures that information attributable to an individual organisation is not disclosed in any publication. [The Code of Practice for Official Statistics](#)¹⁴, and specifically Principle 5: Confidentiality set 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 [Statistical Disclosure Control Methodology](#)¹⁶ page of the ONS website and in the [National Statistician's Guidance on the Confidentiality of Statistics](#)¹⁷ available on the UK Statistics Authority website.

Statutory status

The statutory basis of the Business Spend survey is the [Statistics of Trade Act 1947](#)¹⁸.

Validation and quality assurance

Accuracy

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

The Business Spend estimates cover UK businesses registered for Value Added Tax (VAT) and/or Pay As You Earn (PAYE) and classified to SIC 2007.

The survey obtains its samples from the IDBR which is a database of UK businesses that is maintained by the ONS. The sample is periodically reviewed and optimised. Response rates must be 75% at final results. Respondents are sent reminder letters to encourage response, and are also contacted by telephone to achieve the response targets.

Estimates from this survey are subject to various sources of error. Total error consists of two elements, the sampling error and the non-sampling error.

Sampling error

This occurs because estimates are based on a sample rather than a census. Sampling error is minimised for the Business Spend through the use of a scientifically chosen sample which is reviewed and refined periodically. The Business Spend estimates this error through standard errors and coefficients of variation calculated for all survey outputs.

Non-sampling error

Non-sampling errors can occur due to errors of coverage, measurement, processing and non-response. Response rates give an indication of the presence of non-response error on the estimates (eg bias). Non-sampling error is minimised through comprehensive input and output editing processes and other processes, eg questionnaire design & testing.

In seeking to maximise accuracy of the survey, the sample selection for Business Spend is carried out after the major IDBR update processes for the year are complete. This should minimise the selection of misclassified businesses and defunct reporting units. Business Spend uses the IDBR as its sampling frame and uses it to calculate the design and calibration weights used in combined ratio estimation.

Responses are validated and compared with those for similar units (businesses in the same cell and industry, ie same employment sizeband and same SIC activity). Comparisons are made at respondent data and aggregate level. Disparities and failures in validation are investigated to ensure consistent returns.

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.)

To ensure Business Spend results are coherent, they are checked for consistency against the [Capex⁵](#) and [ABS⁶](#). The [Capex⁵](#) survey is quarterly with a sample of approximately 27,000 businesses and covers the private sector only. [ABS⁶](#) covers production, construction and distribution and has a much larger sample of approximately 65,000 businesses. Both surveys collect total capital expenditure (with some but not all asset detail).

During the [Business Spend¹²](#) data take-on process, individual comparisons of larger businesses are made to ensure that returns to the annual and quarterly surveys are comparable. This is an automatic process and is a part of the annual survey's data validation system.

Business Spend is a small survey consisting of a sample of 2,500 businesses covering the private sectors of the economy. It is one of the measures introduced by ONS to improve the quality of official statistics as part of the DSR package of surveys (agreed in 1998/99). It began as a pilot in 1999 collecting 1998 data.

Since changes to the questionnaire for [SIC \(2003\)¹⁹](#), the only major change has been the removal of the Land and buildings question in line with the [Capex⁵](#) Survey. From 2009, data have been collected under [SIC \(2007\)¹¹](#).

Concepts and definitions

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

The Business Spend is a statutory annual survey conducted under the Statistics of Trade Act 1947, covering most sectors of the economy collecting data on assets; vehicles; new construction work; intangibles and other capital expenditure. These data are used mainly by NAG to improve estimates of [GDP²⁰](#).

National Accounts is the main customer and the results provide the detailed structure of investment incurred by industry. The annual updates of structure provide deflators to the annual chain-linked estimates of [Gross Fixed Capital Formation \(GFCF\)²¹](#). Unlike Capex, there is no other source for this detailed annual structural product breakdown.

Business Spend data form a key input in compiling the annual [SUTs](#)⁷, and is the largest single consistent data source used in compiling the industry by product analyses GFCF. There is no alternative data source that can be used to produce the consistent and coherent detail required. Business Spend has helped to improve the split between GFCF and Purchases of Goods and Services used up in producing the businesses' output. Business Spend is used in weights for using the Producer Price Indices (PPIs) in deflating GFCF.

Other information

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.)

Data are released as five tables in February. All tables are published as percentage data for type of asset and industry group. These data are measured against data from the [Annual Business Survey](#)⁶ (capital expenditure on vehicles, acquisitions and disposals) a much larger and more representative sample. Although not a true reflection as the ABS sample uses public and private companies whereas, the Business Spend only samples private companies.

- Tables 1 and 2 are acquisition and disposal of 'vehicles' by type of assets and industry group.
- Tables 3 and 4 are acquisitions and disposals of 'other' by type of assets and industry but at individual group level eg 17.0 or 25.2.
- Table 5 is acquisitions on 'computer' assets by industry group.

ONS's recommended format for accessible content is a combination of HTML webpage's 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 the ONS, or referenced on the ONS website but stored elsewhere, may vary. 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 \(for data on the website\)](#)²²;
- [Copyright and reuse of published data](#)²³;
- [Pre-release access \(including conditions of access\)](#)²⁴; and
- [Accessibility](#)²⁵.

In addition to this Quality and Methodology Information, Basic Quality Information relevant to each release is available in the background notes of the relevant Statistical Bulletin.

References

Title of Reference	Website Location
1	http://www.ons.gov.uk/ons/guide-method/method-quality/quality/guidelines-for-measuring-statistical-quality/index.html
2	http://www.parliament.uk/documents/commons/lib/research/rp2001/rp01-117.pdf
3	http://www.ons.gov.uk/ons/rel/naa1-rd/national-accounts-concepts--sources-and-methods/august-2011/uk-national-accounts---a-short-guide.pdf
4	http://www.ons.gov.uk/ons/guide-method/method-quality/quality/guidelines-for-measuring-statistical-quality/index.html

5	Quarterly capital Expenditure Inquiry (Capex)	http://www.ons.gov.uk/ons/about-ons/get-involved/taking-part-in-a-survey/information-for-businesses/a-to-z-of-business-surveys/quarterly-survey-of-capital-expenditure/index.html
6	Annual Business Survey home page	http://www.ons.gov.uk/ons/guide-method/method-quality/specific/business-and-energy/annual-business-survey/index.html
7	Supply and Use Tables	http://www.statistics.gov.uk/hub/economy/national-accounts/supply-and-use-tables
8	UK National Accounts	http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/national-accounts/index.html
9	European System of Accounts 1995 (ESA 95)	http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:ESA95
10	UN System of National Accounts 1993 (SNA93)	http://www.oecd.org/std/na/systemofnationalaccounts1993.htm
11	Standard Industrial Classification 2007 (SIC 2007)	http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html
12	Survey into Business Spending on Capital Items (Business Spend)	http://www.ons.gov.uk/ons/publications/all-releases.html?definition=tcm%3A77-21524
13	UK National Statistics Publication Hub Release Calendar	http://www.statistics.gov.uk/hub/release-calendar/index.html
14	Code of Practice for Official Statistics	http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html
15	Winsorisation	http://www.ons.gov.uk/ons/guide-method/method-quality/advisory-committee/2005-2007/thirteenth-meeting/winsorisation-for-estimates-of-change.pdf
16	ONS Statistical Disclosure Control Methodology	http://www.ons.gov.uk/ons/guide-method/method-quality/general-methodology/statistical-disclosure-control/index.html
17	National Statistician's Guidance on the Confidentiality of Statistics	http://www.statisticsauthority.gov.uk/national-statistician/ns-reports--reviews-and-guidance/national-statistician-s-guidance/index.html
18	Statistics of Trade Act 1947	http://www.legislation.gov.uk/ukpga/Geo6/10-11/39
19	SIC (2003) Archived	http://www.ons.gov.uk/ons/guide-method/classifications/archived-standard-classifications/uk-standard-industrial-classification-1992-sic92-/index.html
20	Guide to UK National Accounts GDP	http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/national-accounts/a-guide-to-national-accounts/index.html
21	Gross Fixed Capital Formation	http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:GFCF
22	Terms and conditions	http://www.ons.gov.uk/ons/site-information/information/terms-and-conditions/index.html
23	Copy right and reuse of data	http://www.ons.gov.uk/ons/site-information/information/creative-commons-license/index.html
24	Pre-release access	http://www.ons.gov.uk/ons/guide-method/the-national-statistics-standard/code-of-practice/pre-release-access/index.html

25	Accessibility	http://www.ons.gov.uk/ons/site-information/information/accessibility/index.html
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