

Summary Quality Report for Business Spending on Capital Items Survey

1 Introduction

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. Summary Quality 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 Business Spending on Capital Items Survey (BSCIS) and aims to provide users with information on usability and fitness for purpose of these estimates. The BSCIS collects information on the acquisition and disposal of capital assets.

Capital expenditure is more difficult to measure than many other variables in sample surveys. This stems from two main reasons. 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.

The BSCIS 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). The BSCIS 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.

2 Summary of Quality

2.1 Relevance

The degree to which the statistical product meets user needs for both coverage and content.

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 (for examples see table in 3.1).

	Business Spending on Capital Items Survey
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 (SIC) and all businesses with an employment of 2,000 or above are selected along with a sample of businesses with employment between 100 and 1,999
Weighting	Each business is weighted up to represent a number of similar businesses, based on number of employees and SIC (currently SIC

	2003)
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 treated as outliers are identified automatically using Winsorisation

The main data user of BSCIS is Capital Branch of National Accounts Group (NAG), who use the 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 Capital Expenditure Inquiry \(Capex\)](#)⁴ and the [Annual Business Inquiry \(ABI\)](#)⁵ are broken down using BSCIS 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 result of balanced Supply and Use Tables (SUTs) is a single annual estimate of [UK GDP](#)⁶. The BSCIS 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.

BSCIS is reviewed every five years as part of the government's guidelines for controlling statistical surveys. The review aims to ensure surveys are conducted in such a way as to obtain the information needed while imposing minimum burden on respondents.

Capital expenditure and the [UK National Accounts](#)⁷ are compiled in accordance with the [European System of Accounts 1995 \(ESA 95\)](#)⁸, under EU law. [ESA 95](#)⁸ is itself consistent with the standards set out in the [United Nations, System of National Accounts 1993 \(SNA 93\)](#)⁹. At the industry level results are currently classified by [SIC \(2003\)](#)¹⁰.

2.2 Accuracy

The closeness between an estimated result and the (unknown) true value.

The survey obtains its samples from the IDBR which is a database of UK businesses that is maintained by ONS. The sample is periodically reviewed and optimised. Response rates must be 75 per cent 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 BSCIS through the use of a scientifically chosen sample which is reviewed and refined periodically. From 2006/07 publication, sampling error will be continually monitored with 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.

The BSCIS uses the IDBR as its sampling frame and uses it to calculate the design and calibration weights used in combined ratio estimation. The IDBR is updated frequently but inevitably suffers from some frame error.

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.

2.3 Timeliness and Punctuality

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

Results from the survey are published in [Business Spending](#)¹¹ at the end of January 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 2006 are published in January 2008. The publication date is announced one year in advance on the [UK National Statistics Publication Hub Release Calendar](#)¹² and has been consistently met. In the unlikely event of a change to the pre-announced release schedule, public attention should be drawn to the change and the reasons for the change should be explained fully at the same time, as set out in the [Code of Practice for Official Statistics](#)¹³

2.4 Accessibility and Clarity

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

Access to data at the individual business level is restricted. The confidentiality of the data are legally enforced by the Statistics of Trade Act 1947 [Statistics of Trade Act 1947](#)¹⁴ in Great Britain.

A dataset showing a breakdown of asset spending by industry and asset type is published on the ONS website [Business Spending](#)¹¹.

To accompany the dataset a briefing is compiled which explains the major data movements and supporting information such as response rates achieved, outliers set, and from 2006/07 publication, standard errors and coefficients of variation.

2.5 Comparability

The degree to which data can be compared over time and domain.

The BSCIS 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 improve the quality of official statistics as part of the Departmental Spending Review (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 \(2003\)](#)¹⁰, the only major change has been the removal of the Land and buildings question being removed from the questionnaire in line with the [Capex](#)⁴ Survey.

2.6 Coherence

The degree to which data that are derived from different sources or methods, but which refer to the same phenomenon, are similar.

To ensure that the BSCIS results are coherent, they are checked for consistency against the [ABI](#)⁵. The [ABI](#)⁵ covers production, construction and distribution and has a much larger sample of approximately 63,000 businesses. It collects total capital expenditure (with some but not all asset detail). The BSCIS results are also checked against the Capex Survey.

During the [ABI](#)⁵ 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. Investigation of these errors has been suspended as part of the ONS efficiency programme. A similar process occurs with BSCIS data take-on, with errors being rectified where possible.

3 Summary of Methods Used to Compile the Output

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 BSCIS 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 in the 2,000+ employment size band are permanently included in the sample. Businesses with employment of 100-1,999 are sampled. Businesses with employment less than 100 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.

Combined ratio estimation is used (cells are combined in the same industry across sampled employment size bands) with IDBR employment being 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.

Coverage

The BSCIS estimates cover businesses in Great Britain registered for Value Added Tax and/or Pay As You Earn and are classified using [SIC \(2003\)](#)¹⁰.

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. Full list of SICs covered are given in the following table:

Industry	SIC (2003)
Other Production	1.41,10,11,14, 40, 41
Manufacturing	15-37
Construction	45
Distribution Services	50 – 52
Other Services (for exclusions see below)	55 – 93

Industries not covered are:

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

Statutory Status

The statutory basis of the BSCIS survey is the [Statistics of Trade Act 1947](#)¹⁴.

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 with IDBR employment being the auxiliary variable. Results are processed for each sampled size-band. The top sample band includes all businesses with 2,000+ employment. 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 distribution of many statistics can be heavily influenced by outliers. For example, a 90 per cent [Winsorisation](#)¹⁵ would see all data below the 5th percentile set to the 5th percentile, and

data above the 95th percentile set to the 95th percentile. Winsorised estimators are usually more robust to outliers than their unwinsorised counterparts.

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](#)¹³, 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.

4 References

	Title of Reference	Website Location
1	Statistical Quality	http://www.ons.gov.uk/about-statistics/methodology-and-quality/quality/index.html
2	Private Finance Initiatives (PFIs)	http://www.statistics.gov.uk/CCI/article.asp?ID=1638&Pos=&ColRank=2&Rank=224
3	UK National Accounts: Concepts, Sources and Methods	http://www.statistics.gov.uk/StatBase/product.asp?vlnk=1144
4	Quarterly capital Expenditure Inquiry (Capex)	http://www.ons.gov.uk/about/surveys/a-z-of-surveys/quarterly-capital-expenditure-inquiry/index.html
5	Annual Business Inquiry	http://www.statistics.gov.uk/abi/
6	UK GDP	http://www.statistics.gov.uk/CCI/nugget.asp?ID=56&Pos=3&ColRank=1&Rank=294
7	UK National Accounts	http://www.statistics.gov.uk/CCI/nugget.asp?ID=55
8	European System of Accounts 1995 (ESA 95)	http://circa.europa.eu/irc/dsis/nfaccount/info/data/esa95/en/esa95en.htm
9	UN System of National Accounts 1993 (SNA93)	http://unstats.un.org/unsd/sna1993/introduction.asp
10	Standard Industrial Classification 2003 (SIC 2003)	http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=14012
11	Business Spending	http://www.statistics.gov.uk/statbase/product.asp?vlnk=8167
12	UK National Statistics Publication Hub Release Calendar	http://www.statistics.gov.uk/hub/release-calendar/index.html?newquery=business+spending&lday=&lmonth=&year=&uday=&umonth=&uyear=&theme=&source:agency=Office+for+National+Statistics&pagetype=calendar-entry
13	Code of Practice for Official Statistics	http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html
14	Statistics of Trade Act 1947.	http://nswebcopy/StatBase/Product.asp?vlnk=14121&Pos=&ColRank=1&Rank=422
15	Winsorisation	http://www.statistics.gov.uk/methods_quality/downloads/NSMAC13_Winsorisation.pdf
16	ONS Statistical Disclosure Control Methodology	http://www.statistics.gov.uk/about/data/methodology/general_methodology/sdc.asp
17	National Statistician's Guidance on the Confidentiality of Statistics	http://www.statisticsauthority.gov.uk/national-statistician/guidance/confidentiality-of-official-statistics.pdf

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