

Business Investment QMI

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1 . Methodology background

National Statistic	
Survey name	Quarterly Capital Expenditure Inquiry
Frequency	Quarterly
How compiled	Sample based survey
Geographic coverage	UK
Sample size	27,000
Last revised	30 January 2018

2 . Important points about business investment

- Business investment is a quarterly publication of net capital expenditure by businesses in the UK to estimate the expenditure on non-financial assets within the economy.
- Within the business investment release, gross fixed capital formation estimates are published at broad sector level and asset type; business investment is a sub-component of gross fixed capital formation.
- Business investment contributes approximately 9% to the expenditure approach of gross domestic product (GDP); movements in business investment can affect the overall level of GDP.
- Estimates are available in current prices and chained volume measures, seasonally adjusted and unadjusted; chained volume measures should be used when you are looking to make comparisons over time.
- Improvements were made to the collection of survey data in 2015 around improved questioning; these included the splitting up of telecoms and hardware into separate questions, new questions regarding the transfer costs associated with the buying and selling of football players, and the breakdown of intellectual property products into three separate questions.
- Estimates are available from 1966 onwards on a quarterly basis; data prior to 1997 are to be regarded as indicative only due to limitations in the methods used to compile this dataset (pre-1997).

3 . Overview of the output

Business investment is a quarterly publication of estimates of net capital expenditure by businesses in the UK. It includes capital expenditure by both private and public corporations. Examples of capital expenditure include spending on machinery and plant, transport equipment, software, and new building work. Business investment excludes expenditure on dwellings and the costs associated with the transfer of ownership of non-produced assets.

Within the business investment release, gross fixed capital formation estimates are published at broad sector level and asset type, with a further breakdown of business investment by industry and asset type for the private sector. Provisional results are published in the second month of each quarter and revised results are published in the third month. Estimates are available for current prices and chained volume measures, both seasonally adjusted and unadjusted. Chained volume measures remove the effects of price changes, whilst seasonal adjustment removes the variations associated with the time of the year or the arrangement of the calendar from a time series. Producing data in the form of seasonally adjusted chained volume measures enables the underlying movements to be more easily interpreted.

Business investment is the largest component of gross fixed capital formation, a main component of the expenditure measure of gross domestic product (GDP) published in the UK national accounts. Business investment contributes approximately 9% of total GDP expenditure. The UK National Accounts, which provide the basis for analysing the economic performance of the country, are used throughout business and research communities, education, media and the general public. The accounts are major inputs to HM Treasury (HMT) and Bank of England decisions on fiscal and monetary policy and the forecasts produced by the Office for Budget Responsibility (OBR).

Improvements to the estimation of business investment statistics were implemented in 2017, as part of the programme of continuous improvement to the UK National Accounts. A summary of these improvements can be found in the [Changes to the gross fixed capital formation methodology and processing](#) article. These changes include:

- improvements to the coherence and consistency of data through a review of the conversion of sources across different classifications
- changes to the treatment for transfer costs on non-produced non-financial assets; this change was introduced when Blue Book 2017 was published
- improvements to statistical processing and methodology

The impacts of these methods and systems changes were seen in business investment publications from February 2017 onwards.

4 . Output quality

This report provides a range of information that describes the quality of the data 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 five European Statistical System (ESS) quality dimensions. This report 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.

5 . About the output

Relevance

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

The primary purpose of the business investment release is to publish estimates of spending on capital investment by UK businesses in more detail than is available in the quarterly or annual national accounts releases. Although, unlike much of the rest of the national accounts publications, this is not a European Union legal requirement, publication of these detailed breakdowns is in response to requests by important customers, such as the Bank of England (BoE), the Office for Budget Responsibility (OBR) and HM Treasury (HMT). The estimates are used by these customers for analysis and forecasting, and to inform monetary and fiscal policy decisions.

In addition, estimates published in the release are used widely by other government departments, such as the Department for Business Energy and Industrial Strategy (BEIS), the international research community, business and business consultants, and by the media for commentary on economic trends.

More detailed breakdowns are available on request from gcf@ons.gov.uk. These can be delivered if they meet the required standards for quality and disclosure control. Customers may be charged for special analysis work, in accordance with the Office for National Statistics' charging policy. A list of datasets already created in response to customer requests is also available.

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.)

Provisional business investment estimates are published around eight weeks after the end of the reference quarter, on the same day as the UK National Accounts' Second estimate of gross domestic product (GDP) release. Revised business investment estimates are published around 12 weeks after the end of the reference quarter, on the same day as the quarterly national accounts. The [Blue Book](#)-consistent dataset is published either in June or September, six or nine months after the reference period.

The lapse of time between publication and the period to which the data refer is a trade-off between quality and detail, and timeliness. The provisional results are published only eight weeks after the collection period, to allow customers an early view of the data. The quality is improved in the revised results, published the following month. At this time, the Quarterly Acquisitions and Disposals of Capital Assets Survey, which is the data source for around 56% of the business investment estimates, will have reached its target response rate. As a quarterly indicator, business investment lacks the level of detail available in annual surveys, such as the Annual Business Survey, which has a larger sample size and consequently, a longer processing time, but is instead intended to provide a timely quarterly time series.

For more details on related releases, the [ONS release calendar](#) is available online and provides 12 months' advance notice of release dates. In the unlikely event of a change 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](#).

6 . How the output is created

The business investment estimates are based primarily on the results of the Quarterly Acquisitions and Disposals of Capital Assets Survey (QCAS), which collects data from across the UK economy. In Quarter 1 (Jan to Mar) 2015, the QCAS replaced the Quarterly Survey of Capital Expenditure (CAPEX). This is outlined in the business investment, Quarter 4 (Oct to Dec) 2014 revised results bulletin and in [Changes to the Annual Business Survey, the Quarterly Survey of Capital Expenditure and the Survey into Business Spending on Capital Items, in 2015](#). Investment in dwellings and the costs associated with the transfer of ownership of non-produced assets are excluded from the Business investment release, but are published in the quarterly national accounts.

The QCAS has a sample size of approximately 24,500 UK businesses and is a stratified random sample based on employment size (20 to 49 employees, 50 to 99 employees, 100 to 299 employees and 300 plus employees). It uses the Inter-Departmental Business Register (IDBR) as its sampling frame.

In the QCAS, businesses are classified by industry and stratified by employment. Businesses with an employment size of at least 300 employees are permanently included in the sample. Those with between 20 and 299 employees are sampled on a rotating basis and those with employment under 20 are not sampled to reduce survey costs and burden upon small businesses. In addition to the sampled survey, businesses with fewer than 20 employees who undertake large (more than £5 million) capital spending have their capital expenditure included in the estimates.

Results of the QCAS are weighted using combined ratio estimation and then aggregated at industry level. Capital expenditure of the additional businesses with employment fewer than 20 is given a weight of one. Current price and chained volume measures are derived from the results and both unadjusted and seasonally adjusted series are available.

Businesses with extreme or atypical main variable returns for their business size are detected automatically and treated by Winsorisation Outlier Methodology. An outlier weight is used to give the business a more appropriate weighting. This technique is used to reduce the effect of outlying observations on the overall estimate. The parameters used in this process are reviewed on an annual basis. The chained volume estimates are derived by taking the current estimates and adjusting to remove the impact of price changes using a combination of Producer Price Indices, Import Price Indices, Service Producer Price Indices and Construction Output Price Indices.

As the business investment estimates are used in the production of the gross domestic product (GDP) expenditure estimate and are produced according to the national accounts framework, they are subject to [National Accounts revisions policy](#). They are also subject to adjustments arising from balancing the three approaches to measuring GDP, that is, expenditure, production and income.

Statistical disclosure control is applied to business investment 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 individuals' and businesses' data are protected from disclosure. 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 in the [National Statistician's Guidance: Confidentiality of Official Statistics](#) and also on the [Statistical disclosure control methodology page](#).

7 . Validation and quality assurance

Accuracy

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

Some common pitfalls in interpreting series are:

- expectations of accuracy and reliability in early estimates are often too high
- early estimates are based on incomplete data
- revisions are an inevitable consequence of the trade-off between timeliness and accuracy

Very few statistical revisions arise as a result of "errors" in the popular sense of the word. Most revisions reflect either the adoption of new statistical techniques or the incorporation of new information, which allows the statistical error of previous estimates to be reduced. Only rarely are there avoidable "errors" such as human or system failures and such mistakes are made quite clear when they do occur.

The business investment estimates are quality assured using a variety of standard practices, such as movement analysis at sector, industry and asset level. Any atypical movements are investigated so that the data quality is assured and movements are understood.

All sample survey estimates are subject to statistical error. This refers to the uncertainty in any process or calculation that uses sampling, estimation or modelling. The statistical accuracy is dependent on effective sample design and sample size. The sample design for the Quarterly Acquisitions and Disposals of Capital Assets Survey (QCAS) is regularly reviewed. The sample size of the survey (24,500) represents a trade-off between improved quality for larger samples and costs, both in terms of the burden on respondents and the financial costs of running the survey. Short-term indicators, which are produced several times a year, tend to have smaller sample sizes than annual surveys for these reasons.

The statistical accuracy of the business investment estimates is also dependent on the QCAS response rates. The response rate for the provisional results is lower than that for the revised results, because not all businesses will have responded by the time of publication. Hence, the provisional results are usually less accurate than the revised results.

Revisions are a consequence of the trade-off between timeliness and accuracy. Business investment estimates are subject to revision due to:

- the timing of responses to the QCAS, as described previously
- revisions to seasonal adjustment factors, which are re-estimated every quarter
- the annual update to the Inter-Departmental Business Register from which the QCAS is sampled; this usually occurs in Quarter 1 (Jan to Mar) and has the greatest impact on the results published in May
- the availability of additional public corporations data in the revised release

Not all the public corporations data are available in time for the provisional release, so some are nowcast. In the revised release, these nowcast data are replaced with returned data.

The reliability of the business investment estimates is assessed through analysis of the revisions. The size of the revisions shows how close the values of early estimates are to the revised estimates. The results of these analyses are published in [revisions triangles](#) in the Business investment statistical bulletin. For business investment, two analyses are made: firstly, between the provisional business investment estimates and the revised business investment estimates; and secondly, between the revised business investment estimates and the equivalent estimates published three years later.

Revisions to the business investment estimates are made in accordance with national accounts revisions policy.

8 . Methods improvements

In February 2017, we implemented a new system to estimate gross fixed capital formation (GFCF) and business investment. As a summary, these improvements included:

- improvements to deflation processing resulting in deflators more reflective of the specific assets used by different types of institutional units
- improvement to the level at which current price data is seasonally adjusted (this now aligns to that applied to chained volume measure (CVM) data, that is, at industry total, by detailed asset and sector for acquisitions and disposals)
- better use of our source data leading to a more detailed asset breakdown for some sectors

A more detailed explanation of these improvements can be found in the [Changes to the gross fixed capital formation methodology and processing](#) article that was published in conjunction with the improvements. A data impact assessment was also produced at the time in which revisions to GFCF and business investment were detailed in full. For further information regarding these system improvements, please see [Gross fixed capital formation new system deployment and data impact assessment](#).

Further improvements to the estimation of business investment statistics were introduced in September 2017. A detailed description of these improvements can be found in [Annual improvements to gross fixed capital formation source data for Blue Book 2017](#).

As a summary, these improvements include:

- improving the coherence and consistency of data through a review of the conversion of sources across different classifications
- changes to the treatment of transfer costs on non-produced, non-financial assets
- improvements to the deflation and chain-linking methodology
- changes to the methods used to balance the data in the supply and use tables

Following a [consultation on changes to ONS products](#), completed in February 2016, in our response we stated that we would be reducing the sample size of the Quarterly Acquisitions and Disposals of Capital Assets Survey (QCAS) by 10%. This reduction was implemented in the Quarter 3 (July to Sept) 2016 provisional release so that the survey sample size is now 24,500, compared with 27,000 previously.

Improvements were made to the survey in 2015 to add new questions to improve the quality of our estimates and to meet the latest European legislation requirements. These included the splitting up of telecoms and hardware into separate questions, new questions regarding the transfer costs associated with the buying and selling of football players, and the breakdown of intellectual property products into three separate questions.

Similarly, own account and purchased software were listed as separate questions. A question on the values of acquisition and disposal of databases held by businesses was also asked for the first time. However, as businesses wouldn't necessarily keep records of this type of information to produce an accurate historical dataset needed for a Blue Book publication, data from the new IPP questions were not taken on in the UK National Accounts at Blue Book 2017.

Other changes to the survey were:

- adding new questions to improve the quality of our estimates and to meet the latest European legislation requirements (European System of Accounts 2010: ESA 2010)
- removing the lower limit of £500 for the value of reported assets, so all relevant assets (even those below businesses' Asset Register threshold) can be reported
- including small tools used in production in the definition of GFCF
- improving the questionnaire's layout (including new sections and headings), to make completing the questionnaire easier

Minor changes to the survey in 2015 also included improvements to the option to return a nil value, the clarification of transport assets and the option to include a total value of the expenditure on machinery and equipment.

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.)

Time series for business investment estimates are available on a quarterly and annual basis from 1997 onwards. However, we have also produced a longer time series dataset in containing estimates of business investment from 1965 onwards. This can be found in the [business investment headline data pre-1997](#).

The data sources and methodology used in the production of the Business investment statistical bulletin are consistent with those used in the expenditure measure of gross domestic product (GDP), published in the Quarterly national accounts statistical bulletin.

To ensure that a time series remain consistent, changes to methodology are applied to the whole time series where possible. However, as changes to one component of the national accounts can have an impact on other components, the national accounts revisions policy has been developed to manage this. The revisions policy is designed to give users a clear understanding of which periods are open for revision at each data release and why incorporating revisions from a single source is not a simple matter. This means that not all revisions can be taken on at any time.

Further explanation around coherence, compatibility and balancing form a major part of the article [monitoring the quality of the National Accounts \(PDF, 338.1KB\)](#).

The GSS Business Statistics – interactive user guide is an interactive tool that has been developed to allow users to find what business and economic statistics are available, and choose the right data for their needs. It can be easily used to identify other publications related to investment and capital expenditure.

9 . Concepts and definitions

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

Gross fixed capital formation (GFCF) estimates are compiled using [UK Standard Industrial Classification 2007: SIC 2007](#), used for the first time at Blue Book 2011, replacing the previously used [SIC 2003](#). The introduction of [SIC 2007](#) for GFCF estimates was in keeping with EU regulations and adapted the classifications to changes in the structure of the economy.

Important changes in SIC 2007 include a number of new sections giving more service sector detail while the detail in manufacturing is significantly reduced, reflecting the move towards more services-based economies over the past 20 years. For further information on the introduction of SIC 2007, see [Implementation of Standard Industrial Classification 2007: December 2009 update, Economic and Labour Market Review, December 2009, Volume 3, No. 12](#).

The European System of Accounts 2010: ESA 2010 is the newest internationally compatible EU accounting framework for a systematic and detailed description of an economy. It sets down the harmonised methodology that must be used for the production of national accounts data in the EU. It is crucial to have such a methodological rulebook in the EU, to ensure that statistics on member states' economies are compiled in a consistent, comparable, reliable and up-to-date way. ESA 2010 is internationally compatible, making it possible to describe the total economy of a region, country or group of countries, in a way that is reliably comparable with other economies.

In 2013, we published an article detailing the content for Blue Book 2014, which included the move from ESA 1995 to ESA 2010. This was in line with updates to international standards, which occur approximately every 15 years to ensure economic statistics continue to fairly reflect changes within the economy and measure statistics as well as possible.

10 . Other information

Output quality trade-offs

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

As discussed in the previous sections, there are two main trade-offs for the business investment release:

- sample size: as the sample size of the survey component increases, so does the statistical accuracy and the level of detail that can be published – this is a trade-off with the cost of the survey, the processing time and the burden on respondents
- timing of the publication: publication closer to the period of data collection is timelier – this is a trade-off with accuracy and the likely size of revisions, as earlier estimates will be more uncertain as survey response rates are lower

Assessment of user needs and perceptions

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

We engage with users of our business investment estimates through:

- regular meetings with main users such as the Bank of England (BoE), Office for Budget Responsibility (OBR), Her Majesty's Treasury (HMT) and the Department for Business, Energy and Industrial Strategy (BEIS)
- seeking annual feedback from main national accounts users; a summary of this feedback is published in the UK [Statistics Authority Annual Report](#)
- user engagement events such as The Changing Shape of UK Business
- analysis of ad hoc and email contacts

We welcome your feedback on this and other issues. Further enquiries about business investment estimates can be addressed to the business investment team at gcf@ons.gov.uk. To engage in discussion about business investment and to share information with other users or producers of financial and economic statistics, visit the Financial and Economic Statistics User Group on the Royal Statistical Society's StatsUserNet discussion forum.

11 . 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. We also offer 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 our website but not produced by us, or referenced on our website but stored elsewhere, may vary. For further information, please contact us via email at gcf@ons.gov.uk.

The Business investment statistical bulletin and time series datasets are available to download free from the National Statistics website at 9.30am on the day of publication.

The Business investment statistical bulletin conforms to the standards set out in the UK Statistics Authority's Code of Practice for Official Statistics. Time series used in the Business investment statistical bulletin and time series datasets carry unique identifiers for ease of use. The Business investment statistical bulletin includes commentary on the dataset in addition to relevant graphs and tables.

In addition to this Quality and Methodology Information report, basic quality information can be found in [A short guide to gross fixed capital formation and business investment](#).