

# E-commerce and ICT activity QMI

Quality and Methodology Information (QMI) report for E-commerce and ICT activity statistics relating to businesses, detailing the strengths and limitations of the data, methods used, and data uses and users.

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# 1 . Output information

<b>National Statistic</b>	
<b>Survey name</b>	E-commerce Survey
<b>Frequency</b>	Annual
<b>How compiled</b>	Based on respondent data
<b>Geographic coverage</b>	UK
<b>Last revised</b>	July 2020

## 2 . About this Quality and Methodology Information report

This Quality and Methodology Information (QMI) report contains information on the quality characteristics of the data (including the European Statistical System's five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- decide suitable uses for the data
- reduce the risk of misusing the data

## 3 . Important points

- The E-commerce Survey measures the adoption and use of information and communication technologies (ICTs) and electronic trading, or e-commerce, by UK businesses.
- The results from the survey are published annually in the [E-commerce and ICT activity](#) statistical bulletin; results are also submitted to Eurostat.
- The survey uses the Organisation for Economic Co-operation and Development (OECD) definition of e-commerce; this defines an e-commerce transaction as where goods or services are ordered over the internet, or other electronic networks, regardless of the payment or delivery method.
- A new electronic questionnaire was introduced to the survey for the 2018 reference year; this improvement to the data collection process replaced the paper questionnaire previously used, and it has improved the survey experience for the respondent and how survey results are validated.

## 4 . Quality summary

The policy-owning department for e-commerce and information and communication technology (ICT) is the Department for Digital, Culture, Media and Sport (DCMS). The DCMS's departmental plan includes a priority to "drive the UK's connectivity, telecommunications and digital sectors". Our E-commerce Survey estimates help in monitoring the progress towards these priorities.

From 2000 until 2004, businesses with fewer than 10 employees (micro-enterprises) were included in the survey. This was because of a specific user interest from the then Department of Trade and Industry (DTI). This user interest ended, and so the inclusion of these businesses was discontinued in 2005. However, coverage of micro-enterprises recommenced in 2014 because of renewed user interest.

Eurostat are another important user, and the results enable international comparability between the UK and other countries. The supply of results to Eurostat was an EU legal requirement while the UK was an EU member state.

### Strengths and limitations

Strengths of the survey include:

- the questionnaire is updated annually to reflect changes in the use of the internet and other technologies; this helps to maintain the relevance of the survey
- the survey uses the Organisation for Economic Co-operation and Development (OECD) internationally agreed definition of e-commerce
- the survey results are comparable with countries via a harmonised survey being run in all EU countries

Limitations of the survey include:

- changes to the survey questions every year mean that the availability of comparisons over time will vary; in some cases, data for a particular question are only collected for one year, meaning that comparisons over time are not possible in these instances
- data collection commences in January and asks businesses about their e-commerce and ICT activity for the previous calendar year, and extensive checks are then carried out on the data and results are published in November; the most recent results are therefore based on data from the previous year

### Recent improvements

A new electronic questionnaire was introduced to the survey for the 2018 reference period. This improvement to the data collection process replaced the paper questionnaire previously used. This has improved the survey experience for respondents and how survey results are validated.

## Impact analysis of change in collection mode

The survey includes questions relating to the use of computers and the internet. The new mode of collection is an electronic questionnaire and therefore we could assume that respondents would be less likely to answer these questions incorrectly. This assumption is based on the fact that to complete the questionnaire, respondents will require the use of a computer with access to the internet. When comparing this to the paper questionnaire, a respondent could answer "no" to these questions and be routed past the majority of the questionnaire. As it is now less likely for a respondent to answer these questions incorrectly, this may reduce incorrect reporting for the rest of the survey questions as they would not be routed past them.

A modal impact analysis was therefore conducted, to investigate the potential impact on the survey results from the introduction of the electronic questionnaire.

This analysis concluded that the introduction of the electronic questionnaire has had little overall impact on the comparability of the survey results over time.

The impact on the comparability of results for the monetary values of e-commerce sales has been negligible. Up to just 1% of the growth in total e-commerce sales could be a result of the new mode.

There has been a more noticeable impact on the comparability of results for the proportion questions. Of those variables analysed, the largest impact was with the question on business internet access, which had an estimated 6.1 percentage points of growth attributed to the change in mode. This was followed by the question on use of computers with 5.6 percentage points attributed to the mode change. However, other variables indicated a much lower impact of the mode.

For the analysis, a sample of survey questions were selected based on the largest expected impact on the results (computer and internet use) as well as those that relate to the headline survey results based on e-commerce sales.

Table 1: Sample of survey questions for modal impact analysis

<b>Code Survey question</b>	<b>Type of weighted results</b>
Q010 Does this business use computers?	Percentage of businesses
Q022 What percentage of people in this business use computers with internet access for their work?	Percentage of employees
Q023 What percentage of people in this business use computers, as defined in question 1, for their work?	Percentage of employees
Q038 Does this business have internet access?	Percentage of businesses
Q234 During 2018, did this business receive any orders from customers for goods or services via a website or 'app'?	Percentage of businesses
Q235 During 2018, of total turnover, what percentage resulted from orders received via a website or 'app'?	£ billion turnover
Q257 During 2018, did this business receive any orders from customers for goods or services via EDI type messages (ie electronic transmission methods which allowed their automated processing, for example internet or non-internet EDI, XML, EDIFACT etc)?	Percentage of businesses
Q258 During 2018, of total turnover, what percentage resulted from orders received via EDI type messages?	£ billion turnover
Q386 Does this business use any of the following social media for purposes other than for posting paid adverts? (Note: this question is asked biannually)	Percentage of businesses

Source: Office for National Statistics – E-commerce Survey

## **Estimated modal impact at UK level for proportion question results**

Results for 2018 were re-estimated to adjust for what they were expected to have been, had the survey collection mode remained as a paper questionnaire. By comparing these estimated results to the actual results, we were able to estimate the overall impact of the change in collection mode

Table 2: Estimated mode effects for the proportion questions

Question	2017 actual results from paper mode (%)	2018 results from electronic questionnaire (%)	2018 estimated results if paper mode used (%)	Change between 2017 actual and 2018 estimated (percentage points)	Estimated maximum mode effect (percentage points)
010	85.6	90.2	84.6	4.6	5.6
022	61.1	62.0	60.7	0.9	1.3
023	64.4	65.2	63.9	0.8	1.3
038	83.7	88.4	82.3	4.7	6.1
234	9.8	12.9	11.8	3.1	1.1
257	1.6	1.8	1.7	0.1	0.1
386	32.9	47.2	43.8	14.3	3.4

Source: Office for National Statistics – E-commerce Survey

## Estimated modal impact at UK level for e-commerce sales monetary value questions results

Table 3: Estimated mode effects for the monetary value questions

Question	2017 actual results from paper mode (%)	2018 results from electronic questionnaire (%)	2018 estimated results if paper mode used (%)	Change between 2017 actual and 2018 estimated (percentage points)	Estimated maximum mode effect (percentage points)
235	299.1	365.0	361.5	18.1	1.0
258	283.2	323.4	322.7	12.4	0.2

Source: Office for National Statistics – E-commerce Survey

The results affected by the mode change mainly relate to the results for percentage estimates of ICT use for micro-enterprises. However, these businesses were responsible for only a small amount of the total value of e-commerce sales. Therefore, there appears to have been little impact on the comparability over time of e-commerce sales values. This is because any respondents that may have initially reported that they did not have internet access in 2017, but in fact did have it, are likely to have conducted only a minimal amount of e-commerce. For this reason, time series comparisons relating to proportions of businesses should mainly focus on businesses with 10 or more employees to avoid the discontinuity in the proportions seen for micro-enterprises.

## 5 . Quality characteristics of the E-commerce and ICT activity data

### Output quality

## Sampling error

Sampling error arises because the survey estimates are based on a sample rather than a full census of the population. The difference between the estimates derived from the sample and the value that would be obtained from a census is referred to as the sampling error. As sampling errors cannot be estimated, standard errors (the standard deviation of the sampling distribution) are used instead. The E-commerce Survey provides confidence interval tables that are based on standard errors, as part of the annual publication.

The Inter-Departmental Business Register (IDBR) covers an estimated 99% of UK business economic activity. Therefore, under-coverage is not regarded as a significant issue for the survey.

## Sampling variability and confidence intervals

The estimates in this release are subject to sampling variability, as are those from all sample surveys. The [confidence interval](#) tables contain 95% confidence intervals for selected estimates relating to e-commerce and information and communication technology (ICT) activity.

All of the published estimates come from survey data and so have a degree of statistical error associated with them. Confidence intervals are an indication of the reliability of the estimate: the smaller the interval, the more reliable the estimate is likely to be. With regards to “95% confidence intervals”, we mean that if we repeated our survey 100 times, 95% of the time the true population value would fall within the range of these confidence intervals.

## Output quality trade-offs

The e-commerce data are published 11 months after the end of the reference period. The data then undergo extensive checks prior to publication and we identify important responders who have a significant effect within their sector and/or the total economy. Target response rates for the E-commerce Survey are 80%.

## Coherence and comparability

The survey has followed the Eurostat model questionnaire requirements. The Eurostat model questionnaire is updated every year and serves as the basis of the survey not only in the UK, but also in other EU and non-EU countries, allowing comparability of results between the UK and these countries. Comparative data for EU countries can be found on the [Eurostat website](#).

For some variables, growth over time can be seen where ICT use has been measured on a comparable basis in previous years. Examples of this include the measurement of ICT activities such as internet access, broadband and websites. Results are presented by business employee sizeband. This allows comparisons of the levels of e-commerce trading and ICT activity to be made between different-sized businesses.

Approximately 40% of the survey questions change each year to enable the survey to cover new and developing aspects of ICT use. This continuous improvement to the survey means that the available time series for ICT adoption and use varies and not all time series are updated annually.

The Office for National Statistics (ONS) publishes the monthly [Retail sales statistical bulletin](#), which includes statistics on internet retail sales. E-commerce Survey results for sales in the retail industry are defined as sales by businesses classified to “Retail trade, except of motor vehicles and motorcycles” (division 47 of the [Standard Industrial Classification 2007 \(SIC 2007\)](#)). This is conceptually different to internet retail sales, published as part of the Retail sales statistical bulletin. E-commerce includes all sales by businesses, regardless of who or where the customers are, while retail sales are defined as the sale of goods to the general public for household consumption. Therefore, e-commerce sales by businesses classified to “Retail trade, except of motor vehicles and motorcycles” will be different to internet retail sales as published in the Retail sales statistical bulletin.

The ONS also publishes the [Internet access – households and individuals](#) statistical bulletin. This is a separate release that contains estimates on internet access and use of the internet by households and individuals, not by businesses.

## Concepts and definitions (including a list of changes to definitions)

E-commerce and ICT-related concepts follow Europe-wide standards as defined by Eurostat and the Organisation for Economic Co-operation and Development (OECD). E-commerce refers to transactions over the internet or over other computer networks, for example, electronic data interchange (EDI).

An e-commerce transaction is [defined by the OECD](#) as “the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders.” It is important to note, under this definition, that “the goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online”.

## Geography (including list of changes to boundaries)

All results are on a UK basis, but they are not published at a regional level.

## Accessibility and clarity

The ONS's 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. Our 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 start of this report.

## Timeliness and punctuality

The time between the end of the reference year and the publication date is approximately 11 months for the E-commerce Survey, as the results are published in November each year. In the unlikely event of a change to the release dates, public attention will be drawn to the change and the reason fully explained, as set out in the [Code of Practice for Statistics](#).

For more details on related releases, the [UK National Statistics release calendar](#) 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 Statistics.

## Why you can trust our data

The Office for National Statistics (ONS) is the UK's largest independent producer of statistics and is its National Statistical Institute (NSI). The [data policies](#) detail how data are collected, secured and used in the publication of statistics. We treat the data that we hold with respect, keeping it secure and confidential, and we use statistical methods that are professional, ethical and transparent.

## 6 . Methods used to produce the E-commerce and ICT activity data

### How we collect the data

The E-commerce Survey is an electronic survey that is conducted on an annual basis. It is sent to businesses selected for the survey in January. The completion of the survey by businesses selected is a statutory requirement.

### Sample design

The sample design for the survey is a stratified simple random sample. Approximately 11,000 businesses are sampled.

The strata used in the survey are defined by the [Standard Industrial Classification 2007 \(SIC 2007\)](#) along with employment sizeband. The employment sizebands used are 0 to 9, 10 to 49, 50 to 249, 250 to 999 and 1000 or more.

The sampling frame used for this survey and most business surveys carried out by the Office for National Statistics (ONS) is the Inter-Departmental Business Register (IDBR).

Neyman allocation is used to assign the sample sizes to strata that minimise the variance of subsequent estimates.

The survey covers businesses within the following industrial sectors, according to the SIC 2007:

- Manufacturing: Divisions 10 to 33
- Utilities: Divisions 35 to 39
- Construction: Divisions 41 to 43
- Wholesale: Divisions 45 to 46
- Retail: Division 47
- Transport and storage: Divisions 49 to 53
- Accommodation and food services: Divisions 55 to 56
- Information and communication: Divisions 58 to 63
- Other services: Divisions 68 to 74, 77 to 82 and 95.1

The sectors of the SIC 2007 not covered by the survey are:

- Section A – Agriculture, forestry and fishing
- Section B – Mining and quarrying
- Section K – Financial and insurance activities
- Division 75 – Veterinary activities
- Section O – Public administration and defence, social security
- Section P – Education
- Section Q – Health and social work
- Section R – Arts, entertainment and recreation
- Section S – Other service activities except SIC 95.1, Repair of computers

## **How we process the data**

### **Estimation**

The estimates of the proportions of businesses use number-raised estimation. Results weighted by number of businesses give an equal weight to businesses irrespective of size. This method reflects the greater number of small businesses than large ones. Therefore, estimates of proportions of businesses in “all sizebands” are likely to be closer to the estimates for the 0 to 9 employment sizeband than for the 1,000 or more employment sizeband.

Estimates of the monetary values of e-commerce use the employment of the business with the estimated percentage of total turnover derived from e-commerce. This means that businesses with larger employment have a greater weight in the estimation of the monetary values of e-commerce.

### **Estimation process**

#### **Monetary value estimates of e-commerce sales**

These are the questions where businesses are asked to report what proportion of their turnover is derived from e-commerce. Values are estimated using the following process for each stratum (defined by SIC division and employment sizeband):

- step one: multiply the business' returned percentage by its employment at the time of sample selection, as a proxy for the business' e-commerce sales
- step two: aggregate for all businesses in the same stratum
- step three: divide this total by the employment for all responding businesses in the stratum, to give a weighted percentage for the stratum
- step four: multiply this weighted percentage by the Annual Business Survey (ABS) total turnover estimate for the stratum to create an estimate of value of e-commerce sales for the stratum
- step five: aggregate the values for all the strata in an employment sizeband to obtain a population estimate of the e-commerce sales value for the SIC division, then aggregate the values in the appropriate SIC divisions to produce industrial sector estimates

The example in Table 4 demonstrates the process.

Table 4: Example of value estimation process

	<b>Returned percentage</b>	<b>Employment</b>	<b>Weighted percentage</b>
Business 1	0%	125	0%
Business 2	50%	100	5000%
Business 3	25%	249	6,225%
Total		474	11,225%

Source: Office for National Statistics – E-commerce Survey

The weighted percentage for the cell is then 23.68% (from step three, using 11,225 divided by 474). Given the ABS turnover for the cell is £100 million, the e-commerce estimate for the cell is £23.68 million.

### **Employment-related value questions**

These are the questions about proportions of employment, for example, the proportion of employees who have a computer at work.

The same estimation procedure is used as earlier, but we use IDBR employment instead of turnover.

### **Tick box (yes or no) questions**

These are the information and communication technology (ICT) use questions, such as “does the business have a website?”, “does the business have broadband?” and “does the business sell over the internet?”.

This uses number-raised estimation. The procedure for business weighted estimates is as follows by stratum:

- step one: calculate percentage of “yes” responses in the stratum, that is, number of businesses responding “yes” as a percentage of number responding “yes” or “no” to the question
- step two: multiply by the population count for the stratum on the IDBR as at time of selection; this gives a count for each stratum
- step three: aggregate all the stratum counts
- step four: divide by the total population count on the IDBR as at time of selection, by SIC division; this gives the population estimate for the percentage of businesses that have responded “yes” to the question

## How we analyse and quality assure the data

Some validation checks take place while the respondent is completing the electronic questionnaire. Further validation and editing are carried out once the online questionnaire has been submitted.

## Survey procedures

Survey enrolment letters are despatched to respondents in January, with data processing and analysis taking place prior to Eurostat delivery in October. Once enrolled, businesses complete the survey through the [Secure Data Collection](#) website.

After the data have been electronically read into the survey database, a series of credibility checks are used to assist with the process of validating the data, ensuring that only good quality validated information is included in the results. Detailed checks are carried out to ensure consistency of information on one year's questionnaire, and where a contributor is selected for more than one year, checks are carried out to compare year-on-year consistency of the information.

Data validation checks are automatically applied when the questionnaire is first received, and the data validation staff will contact the business to investigate any dubious data, unless logical corrections can be made if these can be clearly deduced from other returned variables. The questionnaire has a status of “uncleared” until satisfactory explanations are provided by the business for all queries. Until all dubious data are satisfactorily dealt with, no information from that questionnaire is included in the survey results.

## Imputation

No imputations are made for contributor or item non-response, as all data on a completed questionnaire have to pass validation checks before being included in the survey results. The only exceptions to this are where, under certain conditions, a missing percentage was estimated based on other contributors in the same employment sizeband and SIC. For this to take place, the business had to have provided valid returned data for all the yes or no questions and all these had to have passed the validation checks.

## How we disseminate the data

Our primary method of disseminating the data is through our [E-commerce and ICT activity statistical bulletin](#). Results are also supplied to Eurostat. Bespoke special analyses can also be commissioned on request, and these will also be published on our website.

## How we review the data

Revisions are made to the returned data in the previous two survey periods, where appropriate.

## 7 . Other information

For information regarding conditions of access to data, please refer to the following links:

- [Terms and conditions \(for data on the website\)](#)
- [Copyright and licensing](#)
- [Accessibility](#)

The [latest release of the E-commerce and ICT activity statistical bulletin](#) is available on the Office for National Statistics (ONS) website.