

Standard Report
on
Methods and Quality (v3)
for
e-Commerce and ICT Usage

This documentation applies to the reporting period:
2008

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1 Overview

The annual e-Commerce and ICT (Information and Communications Technology) Usage survey for Enterprises measures the level of use of ICT by enterprises in the conduct of their business.

The survey covers industrial, service, financial and building and construction enterprises with 10 or more persons engaged.

This inquiry was initiated to meet national and EU requirements for e-Commerce variables, and is conducted under article 10 of Regulation (EC) No 808/2004 of the European Parliament of the Council of 21 April 2004.

The survey results, which cover a sample of companies with 10+ employees, are grossed to the relevant populations using the latest available grossing factors from the Census of Industrial Production (CIP), Annual Services Inquiry (ASI) and The Census of Building and Construction (CBC).

The provisional results, which contain details for enterprises only, are released in December of the reference year (Information Society Statistics First Results). The final results are published in February of the following year (Information Society and Telecommunications) and contain data on enterprises, households (sourced from the Quarterly National Household Survey (QNHS) as well as telecommunications data sourced externally from ComReg (The Commission for Communications Regulation which is the statutory body responsible for the regulation of the electronic communications sector (telecommunications, radiocommunications and broadcasting transmission) and the postal sector).

There is no formal imputation or estimation for non-respondents to this survey.

2 General Information

2.1 Statistical Category

Primary statistical survey.

2.2 Area of Activity

Science and Technology – Survey on e-Commerce and ICT.

2.3 Organisational Unit Responsible, Persons to Contact

Industry Division - Data Collection Unit

Industry Division - Results Analysis and Publication

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2.4 Objectives and Purpose; History

The purpose of the e-Commerce and ICT survey is to collect data on the level of use of ICT within enterprises for release in the publication 'Information Society and Telecommunications', which also contains data on households from the QNHS and telecommunications data from Comreg.

A pilot survey was conducted in 2002 and a full annual survey began in 2003 and the results were published in each case.

2.5 Periodicity

Since its inception in 2003, the survey on e-Commerce and ICT Usage is carried out on an annual basis.

There have been no breaks in the survey.

2.6 Client

Since 2003, Ireland has been obliged to carry out the survey on e-Commerce and ICT. Initially the Regulation (EC) No322/97 covered e-Commerce survey. Since then the survey has been conducted under article 10 of Regulation (EC) No 808/2004 of the European Parliament of the Council of 21 April 2004.

2.7 Users

- Eurostat/European Union
- Government
- Other CSO sections
- Interest Groups for research purposes
- Professional Bodies
- The general public
- University students

2.8 Legal basis

This inquiry was initiated to meet national and EU requirements for e-Commerce variables, and is conducted under article 10 of Regulation (EC) No 808/2004 of the European Parliament of the Council of 21 April 2004.

3 Statistical Concepts, Methods

3.1 Subject of the Statistics

The subject of the statistics is the level of e-Commerce and ICT usage within Industry, Services, Financial and Building and Construction enterprises with 10+ employees.

3.2 Units of Observation/Collection Units/Units of Presentation

The survey is made up of a sample of approximately 7,000 enterprises with 10+ employees between NACE codes 10 – 92 inclusive. A random stratified sample is taken from the Central Business Register (CBR) of enterprises with 10+ employees. Figures on our release are full figures.

3.3 Data Sources

None - primary survey (census).

3.4 Reporting Unit/Respondents

Reporting unit – Results aggregated to NACE sectors (Manufacturing Sectors, Construction Sector and Selected Services Sectors).

Respondents - Enterprises employing 10+ persons.

3.5 Type of Survey/Process

Survey with a stratified random sample of enterprises with 10+ employees.

3.6 Characteristics of the Sample/Process

3.6.1 Population and Sampling Frame

The survey population is made up of all Manufacturing, Service and Construction enterprises with 10+ employees.

The sampling frame is the CSOs Central Business Register.

3.6.2 Sampling Design

The target population is determined by Eurostat, who provide us with a list of NACE categories and sub-categories that must be surveyed. A draft sample plan is then drawn up which includes all of the required NACE categories. This sample plan is then applied to the Central Business Register, which provides us with a potential sample of respondents. The sample is edited to ensure that no duplicates exist, ceased companies are excluded, no company from an excluded NACE is sampled and companies who requested a specific exclusion from the survey are excluded. While some companies are included every year, care is taken to rotate the sample among smaller enterprise to minimise the response burden. A file of approximately 7,000 potential respondents is then prepared for post-out.

There are specific enterprise size categories also used in the selection of the sample.

Employment Group 1:	10 to 49 persons engaged
Employment Group 2:	50 to 249 persons engaged
Employment Group 3:	250 ⁺ persons engaged

Approximately every 5 years we select a survey sample of micro-enterprises (1-4, 5-9 employees) which increases the number of employment groups.

3.7 Survey Technique/Data Transfer

Survey forms are printed in the Printing Section of the CSO and posted out to respondents for self-completion.

When a survey form is returned to the CSO the form is scrutinised to resolve any errors prior to scanning and a response code put on the form. When a batch is large enough (50 forms) the forms are scanned and verified before being edited.

The failed edits that arise are scrutinised and resolved if possible. If an edit cannot be easily resolved, then the enterprise is contacted for clarification and the edit is subsequently cleared based on the clarification.

3.8 Questionnaire (including explanations)

The 2008 survey on e-Commerce and ICT contains eight modules and gathers information on;

1. General information about ICT systems
2. Use of the internet
3. E-Commerce via the internet
4. E-Commerce via EDI or networks other than the internet
5. Barriers to e-Commerce
6. Automated Data Exchange

7. Supply Chain Management
8. Perceived benefits of the use of ICT

Each year one module in the questionnaire is directly replaced by another module, while some of the questions contained in the other modules are refined. Therefore, the survey questionnaire is in a constant state of development.

The survey form may be accessed on the CSO website at;

http://www.cso.ie/surveysandmethodologies/surveyforms/documents/industry/pdf_docs/econcommercesurvey2008.pdf

3.9 Participation in the Survey

Participation is voluntary.

3.10 Characteristics of the Survey/Process and its Results

The survey is a random stratified sample of enterprises with 10+ employees, which is aggregated and published at National level and also at NACE sectoral level. Results are published for all enterprises and include tables on the 'Use of ICT by Enterprises' and 'Connecting to the Internet'. The data from the survey is grossed to the relevant population by using grossing factors from the latest available Census of Industrial Production (CIP), Annual Services Inquiry (ASI) and Census of Building and Construction (CBC).

3.11 Classifications used

NACE REV1.1 is currently used to produce NACE sectional breakdowns.

Manufacturing enterprises – NACE 15-37

Construction enterprises – NACE 45

Services enterprises – NACE 50, 51, 52, 55.1, 55.2, 60-64, 65.12, 65.22, 66.01, 66.03, 70-74, 92.1-92.7

The following is a link to the Nace Rev1.1 classification listing

http://cmintra01/cso.ie/surveysandmethodologies/classification_indus_act.htm

3.12 Regional Breakdown of Results

Results are not broken down by region. The results are broken down by NACE sectional groups and are aggregated at national level.

4 Production of the Statistics, Data Processing, Quality Assurance

4.1 Data Capture

Once received the return is scrutinised and a response code is put on the survey form. The survey form is then scanned and verified using teleforms software. Edit programs are run regularly using PC-SAS software to clean the returns.

4.2 Coding

When the completed survey forms are received and the response codes are added, the data is captured by NACE class.

When the barcode is scanned the 4-digit NACE code and 2-digit NACE division are also captured.

4.3 Data Editing

Edit programs are run on PC-SAS software to perform checks on consistency of returns between separate questions, between returns for this year and last year and comparisons between enterprises within the same NACE group for this year. No automatic edits are built in to the screen at present.

There are numerous edits carried out every year, examples of which include:

1. Whether the enterprise indicated that they had an Internet connection but no computer.
2. Questions that do not change from year to year are cross-referenced against the previous year's responses for consistency purposes.
3. Whether responses given are consistent with responses from other enterprises within that employment group and NACE classification.

A listing of all the failed edits is sorted by enterprise number and printed. The image of the form is called up on the PC screen and the reason for the edit failure is identified on the form. Each failed edit is checked for any scanning errors and for any comment on the form that may explain the failure. Returns for the previous year are also checked for consistency purposes. If the edit failure cannot be resolved locally, then the enterprise is contacted to resolve any discrepancy. The return is then manually edited on the basis of the explanation from the enterprise. Once all errors are amended a copy is made of the clean dataset.

Reports are run throughout the survey period recording the number of forms returned by NACE group and employment size, the number of edits outstanding and the number of forms scanned compared to previous year.

4.4 Imputation (for Non-Response or Incomplete Data Sets)

There is no formal method of imputation for unit non-response used for this survey. A limited use is made of Structural Business Statistics (SBS) as a method of imputation for item non-response if no details are offered for total employment, purchases and turnover. Also a limited use is made of the Last Value Carried Forward (LVCF) method if a respondent has left a particular field blank and if they responded to this question in the previous year.

4.5 Grossing and Weighting

Grossing is performed using SAS software.

Grossing Factors are taken from the latest available Census of Industrial Production (CIP), Annual Services Inquiry (ASI) and Census of Building and Construction (CBC) and applied to the survey results in order to gross the data up to the relevant populations.

Grossing is done by 2-digit NACE and by employment size class for each of the 3 surveys. Grossing factors are generated for Turnover, Employment and Purchases. This is done by dividing the Total Enterprise Population (NACE and Employment Size) by the Total number of Responses (NACE and Employment). The resulting grossing factors are then used to gross the results of the e-Commerce survey to the population.

Weighting is not used for the derivation of results.

4.6 Computation of Outputs, Estimation Methods Used

Results are aggregated to National level and also a limited number of tables are produced at 2-digit NACE sectoral level. The first results are released in December of the relevant year and a more comprehensive set of results is published in February of the following year.

Estimation is not used for the derivation of results.

4.7 Other Quality Assurance Techniques Used

The sample is selected from the latest version of the Central Business Register (CBR). Duplicate enterprises, companies that have ceased trading or who have stated that they are unable to provide the necessary data are removed from the sample.

Consistency checks are performed against previous returns at enterprise level and against other companies in the same employment group and NACE sector. There is a limited amount of Structural Business Statistics (SBS) data gathered in other surveys (Census of Industrial Production (CIP), Annual Services Inquiry (ASI) and Census of Building and Construction (CBC) and comparisons are made for selected variables for consistency purposes.

5 Quality

5.1 Relevance

e-Commerce is an important indicator used both nationally and by the EU. It provides for inter-country comparisons and analysis of the level of usage and penetration of ICT within the EU 27 as well as providing important national indicators for domestic ICT policy-making.

5.2 Accuracy and Reliability

5.2.1. Sampling Effect & Representivity

A representative sample is taken of all enterprises with 10+ employees. Some editing of the sample takes place to remove duplicates or enterprises that have ceased trading. Eurostat determines the target population. The target NACE categories change every year. The sample is rotated in order to reduce the response burden especially on the smaller enterprises.

Every effort is made to ensure that there is a sufficient number of responses in each cell to be representative of the sample and to ensure that confidentiality is maintained.

Standard errors are calculated at a national level using a methodology devised by Eurostat. A standard error is a measure of the sampling variability or precision of an estimate. Standard errors are used in order to help with the comparisons of results between countries.

For example question C3 in 2008 asked whether the enterprise received orders via the internet during the preceding year.

- The target population was enterprises with 10 or more employees excluding the financial sector.
- The total population was 14,505 and the total 'yes' response was 3,695, which gave a proportion of .25474 approximately.
- The formula for calculating the standard error is the square root of the proportion multiplied by 1 minus the proportion divided by the population
- In this case the calculation is the square root of $(.25474 \times (1 - .25474)) / 14505$ which equals .00361779
- This means that the sampling variability is very small and that the precision of the estimate is likely to be quite high.

The standard errors are calculated for different questions on the direction of Eurostat each year.

5.2.2. Non-Sampling Effects

5.2.2.1 Quality of the Data Sources used

The random stratified sample is taken from the Central Business Register. No other data sources are used.

5.2.2.2 Register Coverage

The sample for this survey is a random stratified sample of enterprises taken from the Central Business Register (CBR). The sample is rotated so that every company should be selected at least once approximately every five years.

Coverage errors – there may be some multiple listings (duplicates) and ceased companies when the sample is first taken from the Central Business Register. They are removed from the sample when discovered. Certain NACE categories are omitted every year. Therefore, coverage is restricted to the required NACE categories only.

5.2.2.3 Non-response (Unit and Item)

Unit non-response: The response rate for the survey is approximately 58%.

The main reasons for unit non-response are as follows:

1. Company Gone-Away from the address on the survey form
2. Duplicate – company receive two forms with different reference numbers
3. Company has ceased trading
4. There is a query about the survey form
5. Hold – company request an extension on the due return date
6. Company is Inactive/Dormant
7. Merger – Takeover or change in structure of company.
8. Company refuses to respond

The section investigates these issues and resolves them as appropriate e.g. ringing the company for confirmation of information, removing the company from the survey etc.

Item non-response:

Where a part of the form is not completed the following is done:

1. Contact Company – to confirm the details on the survey form
2. Last Value Carried Forward (LVCF) for a variable if no other data are available.

5.2.2.4 Measurement Errors

Measurement Error is not formally calculated for the survey. However, the following should be noted:

- (a) questionnaire - we ensure that the questionnaire is clear with definitions provided as appropriate.

(b) data collection method – the collection method is by post. This method is unlikely of itself to be a source of measurement error (e.g. telephone interviewing not used).

(c) interviewer - field interviewers are not used by the survey.

(d) respondent – survey data can contain sensitive and confidential information. Data on turnover, purchases and number of people employed is not published to preserve confidentiality.

5.2.2.5 Processing Errors

(A) Data Capture Errors are likely to be a low risk as survey forms are scanned and verified. There is also the option of manual data entry.

(B) Data Editing - Edits are run which check for the following:

- That all the relevant questions have been answered
- There is internal consistency in answers within the form
- There is consistency with responses from last year if relevant
- There is consistency with enterprises operating in the same employment group and NACE category

If the edit cannot be resolved locally, then the enterprise is contacted to confirm the returned data. The return is manually changed if required.

(C) NACE Code and NACE division are linked to the enterprise number and are captured when the enterprise number is scanned. This means that the possibility of a NACE misclassification error is very low.

5.2.2.6 Model-related Effects

There is no formal imputation for non-response. However, limited use is made of imputation for item non-response from other available resources such as Structural Business Statistics (SBS) and last years return if available.

Grossing factors are generated from the latest Census of Industrial Production (CIP), Annual Services Inquiry (ASI) and Census of Building and Construction (CBC). There is an assumption that this data represents an accurate picture of the level of activity within that sector. Any errors in the grossing factors will affect the results from this survey as well.

5.3 Timeliness and Punctuality

5.3.1 Provisional Results

A clean dataset is sent to Eurostat in early October of the relevant year. Eurostat perform a number of validation checks and if necessary send a list of queries back to the CSO for resolution. When all of the queries have been cleared in all the participating countries, Eurostat publish EU27 results in early December. The CSO also releases selected results in early December (Information Society Statistics First Results).

5.3.2 Final Results

A full set of results gathered from a number of surveys including enterprise and household surveys is published in February of the following year (Information Society and Telecommunications).

5.4 Coherence

Data for e-Commerce is checked for consistency with previous returns and with enterprises in the same employment class and NACE sector. The Structural Business Statistics (Turnover, Purchases, Number Employed) contained within the e-Commerce survey are compared to the SBS data gathered in other surveys for consistency purposes. Any differences that are found are resolved on an individual enterprise basis.

5.5 Comparability

The pilot e-Commerce survey was first carried out in 2002 and the full e-Commerce survey has been carried out annually since 2003.

Certain modules contained within the survey change every year, therefore some variables may not be directly comparable to previous years.

A random stratified sample is selected every year. While some enterprises are included in the sample every year, the sample is rotated every year in order to minimise the response burden, especially on the smaller enterprises. This means that it may not be possible to compare returns for individual enterprises from year to year.

Where possible comparisons are done with;

- Previous year
- Other enterprises operating in the same employment group and NACE category.
- Structural Business Statistics (SBS) gathered from other surveys, notably the Census of Industrial Production, Annual Services Inquiry and Census of Building and Construction.

Eurostat also does comparisons between the EU27 states on the data returned by individual countries.

5.6 Accessibility and Clarity

5.6.1 Assistance to Users, Special Analyses

The publication is available on the CSO web site at

<http://www.cso.ie/releasespublications/documents/industry/2007/ictireland2007.pdf>.

The questionnaire and background notes are also available at

http://www.cso.ie/surveysandmethodologies/surveyforms/documents/industry/pdf_docs/ecommercesurvey2008.pdf

Specific user requests are acceded to where possible, and where confidentiality issues do not arise.

5.6.2 Revisions

Some revisions may occur as a result of queries received from Eurostat or other national users.

Full (and final) results are published in February of the following year and generally are not subject to revision.

5.6.3 Publications

5.6.3.1 Releases, Regular Publications

'Information Society Statistics – First Results' is released in December of the reference year.

'Information Society and Telecommunications' is published in February following the reference year and contain final results.

5.6.3.2 Statistical Reports

Statistical Yearbook

5.6.3.3 Internet

<http://www.cso.ie/releasespublications/documents/industry/2007/ictireland2007.pdf>

5.6.4 Confidentiality

All data are treated as strictly confidential in accordance with Part V of the Statistics Act, 1993.

In order to ensure confidentiality, results are produced at NACE sectional level.

6 Additional documentation and publications

Further information can be found on the StatCentral website (the portal to Ireland's official statistics) at :

<http://www.statcentral.ie/viewStat.asp?id=27>