

Summary Quality Report for the Annual PRODCOM 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 National Statistics 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 Annual PRODCOM (PRODUcts of the European COMmunity) Survey. The PRODCOM Survey is a European initiative and is governed by EU regulation. It is a compulsory survey for UK businesses and is collected under the statutory powers of the Statistics of Trade Act 1947 for Great Britain, and Employment (NI) Order 1988 for Northern Ireland. PRODCOM is a Harmonised System (the Harmonised Commodity Description and Coding System, a worldwide reference for classifications of external trade statistics and for customs tariffs) for the collection and publication of product statistics. This report specifically concentrates on the PRODCOM Survey and aims to provide users with guidance to assess the quality and usability of the PRODCOM estimates.

2 Summary of Quality

2.1 Relevance

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

The PRODCOM Survey is governed by European Union Regulation 3924/91 and covers Mining, Quarrying and Manufacturing. It does not cover most of the new industrial services identified in the Classification of Products by Activity 2002 (CPA 2002), nor does it cover Recycling or Energy products. The product definitions are standardised across the EU to give comparability between member states' data and the production of European aggregates at product level.

The EU regulation requires all EU member states to produce value and volume estimates for a list of products manufactured on their territory. The list is issued by Eurostat and accordingly, PRODCOM annually collects data from across 234 industries for 3,866 products.

All industry sectors published align exactly to the Nomenclature des Activites Economiques dans la Communaute Europeenne (NACE) classification. The NACE classification is the industrial classification system of the European Union (EU). The PRODCOM list of products is partially defined by the NACE classification, and partly defined by the classification of product by activity (CPA). All product heading numbers (referred to as PRODCOM Commodity Codes (PCC's)) used for classification are defined by one or more headings of the Combined Nomenclature (CN) which is the EU system for classifying products used to collect trade data through customs procedures. The classification system allows the manufactured sales of products to be aligned with trade statistics measuring the flow of goods into and out of each member state.

	PRODCOM
What it measures	Value and volume data from UK manufacturers for 3,866 products
Frequency	Annual
Sample Size	Approximately 21,800
Periods available	Quarterly from Quarter 1 1996; Annually, 1993 to present
Sampling frame	Inter-Departmental Business Register (IDBR)
Sample design	Stratified random sample where the strata are defined by SIC and employment size of a business
Weighting and Estimation	Estimates are produced using a non-linear estimator. An estimate is made for the number of businesses by stratum that make a particular product (using a simple expansion estimator). Then a separate estimate is made for the average Sales Per Head (SPH) by industry for those businesses that make that particular product (using a ratio estimator based on employment). These two estimates are finally multiplied together to give an estimate of total sales for the product
Imputation	Automatic imputation, using a ratio estimator for businesses classified to homogenous industry and size-band, is used when unit non-response occurs. An influential key responder ie, someone that is known to make a significant contribution to product estimates, would have its details manually constructed if it did not respond based on previously provided product breakdowns
Outliers	Outlier trimming, the removal of atypical responses, occurs based on SPH (SPH = Value of commodity sales/employment). The top and bottom five per cent of SPH for the home industry where there are ten or more observations are trimmed. The same rule is applied where there are ten or more observations in carry-in industries, see section 2.4

PRODCOM estimates provide businesses and researchers with a powerful tool for market analysis. By combining them with the overseas trade statistics, users can derive various other statistics for example shares of exports, the net supply to the market and unit prices for production, imports and exports; all at the product level.

PRODCOM statistics are also used in ONS and by other government departments and non-government users. The key users and uses of the output include:

Producer price indices (PPIs)

[PPIs](#)⁵ are published monthly by ONS. They are used to monitor inflation in the economy and as deflators to convert from current to constant prices in the national accounts.

The [PPI](#)⁵ is produced by measuring the price movements of a basket of goods produced by the manufacturing sector over time. PRODCOM data on product sales are used to weight the various output price indices in the [PPI](#)⁵. Detailed [PRODCOM Product, Sales and Trade](#)³ data are used to select the sample for [PPI](#)⁵.

PRODCOM estimates are essential for [PPI](#)⁵ rebasing, re-weighting of respondents, item price quotes, indices and possible chain linking. The [PPI](#)⁵ team have confirmed that there is no other source of information available in the detail required. Ideally they would like to have equivalent estimates for the service industries.

Current price supply use tables

PRODCOM outputs are required as part of the supply table; an integral part of the annual input-output balance used to reconcile the three measures of Gross Domestic Product (GDP) and Gross National Income (GNI). The function of the supply table in the annual balance is to analyse the output of industries by product thus giving an estimate of domestic supply.

PRODCOM value estimates are required in order to analyse total turnover, work done and industrial services rendered for each production industry at the input-output group level.

PRODCOM outputs form an essential part of the current supply use tables. Without reliable PRODCOM estimates the integrity of the balance struck, and hence the National Statistics estimate of GDP and GNI is threatened. There is no other source of information available in the detail required.

Inter-Departmental Business Register (IDBR)

The PRODCOM Survey currently has a large influence on the classification of businesses in the IDBR; the sampling frame for many National Statistics business surveys. Businesses are classified to a particular industry according to their main economic activity in terms of employment. PRODCOM is a major source of classification for the IDBR.

Other government uses

Apart from ONS, PRODCOM outputs are also used by the Department for Business, Enterprise & Regulatory Reform (BERR) to analyse sectors such as healthcare, and electronics which span a number of SIC groups. PRODCOM also provides a greater level of detail into business activity compared to other surveys, monitoring industrial activity at macro and micro economic level. BERR have commented on the number of estimates that are marked as disclosive (suppressed) in some industries and would like products to be combined to allow more estimates to be made available.

The Scottish Government and the National Assembly for Wales have an interest in PRODCOM figures and use PRODCOM regional figures in the compilation of their Indices of Production. The benefit of using PRODCOM estimates is that they provide sufficient coverage to enable a satisfactory quality to be maintained in their indices. The Scottish Government requires current supply use tables as there are no alternative sources of information that can be used to provide product level estimates on this basis.

Eurostat

[Eurostat's](#)² role is one of co-ordinator, data compiler and distributor as opposed to being actual data users. Its primary role is to facilitate the collection and collation of member states' statistics and to disseminate the information via the EUROPROM CD-ROM and their website. [Eurostat](#)² is able to provide official estimates to various users who require reliable and comparable figures regarding the range of products covered by the PRODCOM regulation. Some of these users are:

- the European Commission which requires such information for defining, implementing and analysing EU policies
- national governments
- trade and industry
- the news media
- private individuals

PRODCOM plays an extremely useful role in analysing the competitive performance of individual countries. Inside [Eurostat](#)² and the European Commission, some of the areas envisaged for further use of PRODCOM results are:

- better measures of individual productivity and unit costs
- analyses of industries by principal products. The Commission is greatly interested in examining the structure of individual industries
- analyses of markets

2.2 Accuracy

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

Standard error estimates are available for most product level value estimates and also for the standard headings (eg work done, merchanted goods etc). Currently, standard error estimates are not available for volume, total turnover, and aggregated totals that are collected

in the PRODCOM Survey. However, the calculation of such estimates is currently under consideration.

Information concerning standard errors and other quality measures is published separately from the main report and is made available on the National Statistics Website alongside their relevant industry report, soon after the industry estimates have been finalised. Standard error estimates are available from 2000 for the 203 annual industries, and Quarter 1 2001 for the 47 quarterly industries.

Product quality measures

The following information is available for each PRODCOM Commodity Code (PCC), an eight-digit code of which the first four digits indicate the industry for which it is one of the Principal Products, and each data period within the run (time) period:

- published estimate for the product
- estimates of Standard error
- standard error as a percentage of the published value (the coefficient of variation)
- number of businesses providing data for the product; the number of businesses in the PRODCOM sample who make the product
- total employment of businesses providing data for the product

Note: Here “business” refers to a Reporting Unit, a group of businesses under common ownership.

A business is deemed to have provided data if they return a non-zero sales value for that product. Businesses whose sales value has been imputed or constructed as a non-zero figure are also classed as providing data.

Standard error

Using the data from our sample, the sales of the non-sampled businesses and those businesses who have never responded to the survey are estimated. The estimated total of product sales is then calculated.

The most obvious way of assessing the quality of estimates is through the use of standard error statistics. Estimates produced from a sample survey will rarely be identical to the population value, but statistical theory allows us to estimate the precision associated with any survey result. Standard errors are an estimate of the sampling error, which arises because an estimate is based on a survey rather than a population census. It is a measure of the precision of the estimate. A low standard error therefore indicates a precise estimate.

To aid comparison and interpretation, the standard error is also expressed as a percentage of the product’s estimated total sales. This quantity is sometimes called the coefficient of variation (CV) and it allows the standard errors to be put into context. For example, a standard error of £0.3 million may only represent 1 per cent of the published value in some instances but 100 per cent in others.

Non-sampling error

It is important to note that non-sampling errors such as measurement error and response bias cannot be measured easily. Examples of such errors include the misreporting of sales when completing the questionnaire and any bias caused by the viewpoint of the questionnaire recipient. However, great effort is made when designing the questionnaire to minimise the risk of such errors.

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.

The [National Statistics Release Calendar](#)⁶ is available on the National Statistics website and provides twelve months’ advance notice of releases. The PRODCOM Survey has always met publication deadlines. In the unlikely event of a change to the pre-announced release

schedule, public attention would 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](#)⁷. In addition, article 7.1 of the [PRODCOM Regulation \(EU Regulation No 3924/91\)](#)¹⁷ requires that 'Member states shall send the findings relating to a one year period to the Statistical Office of the European Communities within six months after the end of the reference year. These findings shall include data which are confidential under national law; their confidential nature shall be explicitly stated'.

For the 2006 Annual PRODCOM survey, a provisional set of results were supplied to [Eurostat](#)² by 30 June 2007 and made available on the [Eurostat](#)² website. Up to and including the 2007 survey period, these estimates have been updated as individual [Product, Sales and Trade](#)³ reports and published on the National Statistics website along with their corresponding quality measures.

As a result of the [PRODCOM Quinquennial Review](#)⁸ conducted in June 2007, it was recommended that PRODCOM estimates are published in their entirety in July on the National Statistics website and revised at a later stage.

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.

PRODCOM 2007 estimates are available in an [Excel format](#)¹⁵ which enables users to manipulate data to suit their needs. However, all estimates produced prior to 2008 were produced in a series of reports entitled [Product, Sales and Trade](#)³. The reasons for the change in format are clearly explained in the [PRODCOM 2007 Quinquennial Review](#)⁸.

In addition to production items PRODCOM also collects data on some non-production items.

- Merchant goods – These are manufacturers' sales of goods that have not been subjected to any manufacturing process
- Work done – Revenue is recorded under 'work done' when a manufacturer conducts work on materials that have been supplied to them by a customer
- Waste products – These are manufacturers' sales of products and residues that are considered as being waste
- All other income – This is revenue derived from the provision of services and other non-production activity not specified elsewhere

'Carry-in' and 'Carry-out' sales

Other than production of Principal Products, an industry may have some secondary production. These sales are known as 'carry-out' product sales as they are sales of products classified as principal to a different industry. Conversely, 'carry-in' product sales are defined as sales of products classified as principal to an industry that are made by businesses classified to other industries.

Therefore, one industry's carry-out product sales are another's carry-in product sales and vice-versa. For example, a business classified as a footwear manufacturer may also manufacture luggage. The footwear industry therefore has carry-out sales to the luggage industry, and the luggage industry has carry-in sales from the footwear industry. Carry-in and carry-out sales for a product are combined together to give the published value for the product.

'Other' sales

Where businesses produce relatively small amounts of certain products these are often grouped together in an 'Other' category to lessen the burden on businesses responding to the survey. The category will include products with an annual sales value of less than £25,000 in each business

Individual product information

The product information contains the PRODCOM, imports and exports estimates for each individual product classified to that industry. The trade figures are matched to the PRODCOM estimates for each product via the Combined Nomenclature (CN) coding system used for the collection of trade data at the product level.

The unit volume collected under PRODCOM is indicated in each product PRODCOM unit. In general the volume is collected in weight (kilograms) to retain comparability with the imports and exports data collected by [HM Revenue & Customs \(HMRC\)](#)⁹ via the Combined Nomenclature (CN) coding system used for the collection of trade data at the product level.

Further information

For further information about PRODCOM contact:

PRODCOM Publications Enquiry Point,
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Newport NP10 8XG
Tel : 01633 456746
E-mail: prodcompublications@ons.gov.uk

2.5 Comparability

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

An extensive revision of NACE in 2007 has resulted in changes to PRODCOM estimates for the 2008 survey onwards. All industry sectors now align exactly to the NACE classification. This is different from previous years where, in some instances, the UK published PRODCOM estimates under its own Standard Industrial Classification (SIC) which only matched the NACE classification to the first four digits. Such [changes to PRODCOM](#)¹⁴ are explained in more detail on the National Statistics website.

In its current form PRODCOM collects data from 234 industries on an annual basis. However, prior to 2005, data was collected from 47 industries on a quarterly basis, and 211 industries an annual basis. [Backdated estimates](#)¹⁶ are available on the National Statistics website. Quarterly estimates are available dating back to quarter 1 1996, and annual industry reports are published dating back to 1996 with time series data backdated to 1993. It is estimated that this reduction reduced the cost of compliance on businesses by £350,000. Consistent time series for 1995-1999 (including the data contained within this report) have been produced on the basis of these methodological improvements. Users may therefore see differences between the new output series and those published for previous years. It should also be noted that the employment question has been removed from the survey.

PRODCOM covers NACE divisions 0710 to NACE 3320 under NACE Rev 2. The exception to this is NACE 2410. This collected by the Iron and Steel Statistics Bureau (ISSB) but still included in PRODCOM.

Analogous surveys are run by other EU member states, therefore allowing European aggregates of product sales to be derived. PRODCOM estimates are supplied to [Eurostat](#)² for publication which permits international comparisons with estimates from other European countries. This enables the Commission to monitor manufacturing activities in the single European market.

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.

Apart from PRODCOM, there are a number of other National Statistics surveys that collect related data.

Annual Minerals Raised Inquiry (AMRI)

The AMRI collects volume data for minerals extracted. Since 1995 data collected by AMRI have been used in the PRODCOM survey to avoid duplication.

Monthly Production Inquiry (MPI)

The MPI only collects total turnover, not data about the individual products manufactured by respondents. There are, however, a significant number of respondents who return only one product figure to PRODCOM and it is, in theory, possible that this information could be collected through MPI for PRODCOM. The option for MPI to collect data on single product manufacturers has been monitored and carefully reviewed but was rejected because of the differences between sampling, classification updates on the IDBR (there may also be discontinuities in respondent reporting arrangements) and because there would be no notification in changes of product discontinuities in respondent reporting arrangements. Also, there would be no notification in changes of product, no volume data available and no representation in the 0-9 employment size-band of businesses.

Annual Business Inquiry (ABI)

The [ABI](#)¹⁰, previously the Annual Census of Production (ACOP) also collects total turnover plus other variables similar to the standard headings collected by PRODCOM. The feasibility therefore exists of collecting the standard headings on behalf of PRODCOM. There are, however, difficulties associated with this.

While data at the individual respondent level are required by both surveys, [ABI](#)¹⁰ collection allows financial year-end whereas PRODCOM collects a calendar year. Therefore, if [ABI](#)¹⁰ collected data on behalf of PRODCOM it would not be possible to meet all of the [Eurostat](#)² regulation in terms of timeliness. In addition, employment size-bands are different to PRODCOM. This could lead to considerable differences in sales values for individual product headings in the smaller size-band because [ABI](#)¹⁰ collects data on total sales of own manufactured products, not sales of individual manufactured products.

UK Trade Data

The [UK Trade Data](#)¹¹ (exports and imports) are collected by [HMRC](#)⁹ and measure the flow of goods into and out of the UK.

Total exports and imports are broken down into intra and extra EU trade ie trade with members of the EU, and trade with countries outside the EU.

Intra-EU trade data are collected by [Intrastat](#)¹², a survey based system operated by [HMRC](#)⁹ covering the largest traders. Extra-EU trade data are collected from information given on [HMRC](#)⁹ documentation which has to accompany goods passing through border controls.

3 Summary of Methods Used to Compile the Output

Given the vast number of variables being surveyed, ONS developed the concept of a personalised questionnaire for businesses selected for the survey. The business is only asked to provide data for those products that it is known to manufacture with blank spaces to add others. Although the results of PRODCOM surveys cover businesses of all sizes, ONS is particularly conscious of the load that providing information can impose on the smallest businesses. It puts effort into sampling for these businesses and ensuring that no more than necessary are selected.

The sample design selects businesses by employment size and industry classification. Additional constraints are built into the sample design with a view to restricting the burden of completing questionnaires on smaller businesses.

Coverage

The PRODCOM estimates cover UK businesses registered for Value Added Tax (VAT) and/or Pay As You Earn (PAYE) and are classified to NACE divisions 07 through to 33 under [SIC 2007](#)⁴. PRODCOM obtains the required details on these businesses from the IDBR which is then used as the sampling frame.

Sample design

The PRODCOM sample covers around 21,800 businesses from across the manufacturing and production sections of the UK economy. The IDBR is used as the sampling frame from which a stratified random sample is drawn. The strata are defined by SIC at industry sub-class level and by employment size, with all employment sizes of businesses being covered.

The current sample design consists of:

- five employment size-bands, 0-9, 10-19, 20-49, 50-99 and 100+
- three employment cut-off thresholds (of 20, 50 and 100) where all respondents above this point are selected (the cut offs previously ranged from 20 up to 1000+). The cut off level for each industry has been calculated according to the accuracy
- The size-bands from ten employees up to the employment cut-off threshold have an optimal number of respondents to be selected for the survey. The number to be selected has been calculated to minimise the burden of sampling, without compromising the calculation of final estimates. These respondents are selected using a PRN (Permanent Random Number) sampling method. Between selections a number of businesses in the sample are rotated out and a similar number rotated in
- the 0-9 size-band has a maximum number of 1500 respondents and is covered by ONS Osmotherly rules (which came into effect in 1997). These rules guarantee respondents a survey holiday of three years after responding to the survey
- rotation has been set at 10 per cent per year for the annual survey for the strata below the cut-off. This should result in a new sample after approximately ten years

Estimation

Surveying every business in the manufacturing target population would be costly and place unnecessary burden on businesses. Therefore, it is necessary to estimate totals from the returned data of the sampled area. This means that total UK manufacturer sales are calculated from the total returned sales of businesses (including imputed & constructed) plus the estimated sales of businesses that have never returned their questionnaire/were not in the sample.

Weighted element

The estimated total product sales of businesses that were not in the sample or have never responded is called the *weighted element*. The addition of the weighted element to the returned sales is called the *weighting procedure*.

Note about the methodology behind PRODCOM estimation

The estimation procedure is based on the sales per head (SPH) of the returned data. There is auxiliary information about the businesses that are being estimated for as their employment is known (obtained from the IDBR). Product propensity is also used as the probability of a business making a particular product.

Statistical Disclosure

PRODCOM is conducted under the Statistics of Trade Act 1947. This Act imposes restrictions on the way that data collected during the survey may be used. This ensures that information attributable to an individual organisation is not disclosed in any publication. The [Code of Practice for Official Statistics](#)⁷, 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 ONS [Statistical Disclosure Control Methodology](#)¹³ page.

4 References

	Title of Reference	Website Location
1	Statistical Quality Programme	http://www.statistics.gov.uk/about/data/methodology/quality/default.asp
2	Eurostat	http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090.1&_dad=portal&_schema=PORTAL
3	PRODCOM Product, Sales and Trade Reports	http://www.statistics.gov.uk/onlineproducts/default.asp#commerce
4	Standard Industrial Classification (SIC)	http://www.statistics.gov.uk/methods_quality/sic/downloads/SIC2007explanatorynotes.pdf
5	Producer Price Indices (PPI)	http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=790
6	National Statistics Release Calendar	http://www.statistics.gov.uk/ReleaseCalendar/currentreleases.asp
7	Code of Practice for Official Statistics	http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html
8	PRODCOM Quinquennial Review	http://www.statistics.gov.uk/downloads/reviews/QuinquennialReview.pdf
9	HM Revenue & Customs	http://.customs.hmrc.gov.uk
10	ABI methods and terminology	http://www.statistics.gov.uk/abi/
11	UK Trade Data	http://www.uktradeinfo.com
12	Intrastat	http://www.uktradeinfo.com/index.cfm?task=intrastat
13	Statistical Disclosure Control Methodology	http://www.statistics.gov.uk/about/data/methodology/general_methodology/sdc.asp
14	Changes to PRODCOM	http://www.statistics.gov.uk/downloads/theme_commerce/Changes-to-PRODCOM-and-the-PRA-Series-of-Reports.pdf
15	PRODCOM estimates (Excel format)	http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=9660
16	Backdated estimates	http://www.statistics.gov.uk/onlineproducts/default.asp#commerce
17	European Union Regulation 3924/91	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1991R3924:20080101:EN:PDF

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