Summary Quality Report for Northern Ireland Construction Output Statistics

Introduction

This report covers Northern Ireland Construction Output statistics published in the Northern Ireland Construction Bulletin. It is intended to provide users with information on how the statistics have been compiled and the quality of the information upon which they may be drawing conclusions and making decisions, in line with the UK Statistics Authority Code of Practice for Statistics.

Summary of Quality

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

The Construction Output Statistics published in the Northern Ireland Construction Bulletin are intended to provide a general measure of quarterly changes in the volume and value of construction output in Northern Ireland. The information is broken down by a number of variables including – New Work/Repair and Maintenance, Housing/Infrastructure/Other Work, and Public/Private.

The Construction Output statistics are used by National Accounts in the calculation of the output measure of UK Gross Domestic Product (GDP) and also by the Northern Ireland Composite Economic Index (NICEI) in the calculation of the output measure of NI Gross Value Added (GVA).

The results are also used by Northern Ireland Government Departments, Economists, Construction Industry Analysts and Academics to understand the state of the construction sector in Northern Ireland and the wider Northern Ireland economy. For more information please see the summary of usage document for the Northern Ireland Construction Output Statistics.

Accuracy
The proximity between an estimated result and the unknown true value.

Estimates from the Quarterly Construction Enquiry (QCE) are subject to various sources of error that can be categorised into sampling and non-sampling error.

Sampling Error

Construction output estimates derived from the QCE are subject to sampling error. This occurs because the estimates are based on a sample rather than a census of all construction firms. Sampling error is minimised on the QCE through the use of a scientifically chosen sample.

The sample is disproportionately stratified (into six strata) using Inter-Departmental Business Register (IDBR) turnover as the stratification variable. This type of design ensures greater sampling efficiency and accuracy, particularly where there is extreme variability across the population (such variability is lessened within individual strata). The sample design also reduces the burden on small firms.

As variability and turnover is very high within strata 5 and 6, a census of all these firms is taken in the QCE. This census element accounts for approximately three fifths of total construction turnover based on IDBR.

The remaining sample members are selected using the Neyman formula to maximise the precision of the sampled element of the survey and to minimise sampling error.

Of the remaining sample members, variability (of turnover) is least in stratum 1 and greatest in stratum 4. Consequently, a higher disproportionate sample is taken within strata groups as the turnover bands increase (see Table 1).

Table 1: 2023 Sample for the Quarterly Construction Enquiry

Stratum	IDBR Turnover £'000	IDBR Population (Divisions 41-43 excluding 41.1 (Property Developers))	Actual Sample
1	0-124	4,906	84
2	125-549	3,534	170
3	550-2,099	1,164	179
4	2,100-5,249	290	115
5	5,250-10,499	111	109
6	10,500+	130	130
Total		10,135	787

Non-Sampling Error

Coverage error

The error which arises because some units are either excluded or duplicated on the sampling frame used to identify the population of interest. Coverage error arises because not all construction firms in scope for this survey are contained on the IDBR.

Firms not listed on the NI extract of the IDBR (for example, Great Britain/Republic of Ireland firms) who carry out construction work in Northern Ireland cannot be sampled and therefore the QCE does not capture the construction activity of these firms.

The construction activity of self-employed construction workers not listed in IDBR is also not captured in the QCE.

Non-response error

Non-response can reduce the precision of survey estimates. Strategies for minimising non-response to the QCE include issuing email and paper reminders; telephone response chasing which is prioritised to target strata where coverage has not reached a specified target response rate; and capturing data returns over the telephone. In the QCE, imputation is used to estimate non-response for business with an annual IDBR turnover greater than £5,250,000 (see the QCE background methodology paper for details on imputation).

The response rate is a measure of the proportion of sampled units who respond to a survey. This indicates to users how significant the non-response error is likely to be. Unweighted response rates for all strata for each quarter, dating back to 2000, can be found on the NISRA website.

Measurement error
Measurement error is the error that occurs from failing to collect true data values from firms.

The definition of construction output is complex and it is possible that measurement errors result from firms returning turnover data or another measure of activity which better matches their accounting processes. To assist firms, the definition of output is provided in each part of the survey form. The responses of firms in each strata are checked for internal consistency and quarter-on-quarter comparisons are carried out. Disparities are investigated with firms to ensure consistent returns. Firms are only required to make a return in construction categories that they carried out work in (for example, New Work Housing Private, Repair & Maintenance Housing Private). It is assumed, therefore, that there is little or negligible item non-response in returned forms.

Processing errors

There is a risk that data may be entered incorrectly into the system. Processing errors are minimised through comprehensive input and output validation checks (each inputted figure is cross checked by another member of the QCE Team). The responses of firms in each strata are checked for internal consistency and quarter-on-quarter comparisons are carried out. Disparities are investigated with firms to ensure consistent returns.

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Respondent error

Respondent error arises when a respondent returns an incorrect value. Various validation checks are also carried out by the QCE team to identify results that are extremely implausible but not impossible. This will take the form of validation against previous returns to identify any unusual increases and decreases. Contributors whose quarterly returns show an increase or decrease above a certain threshold are contacted and asked for an explanation (if they have not already provided one on their original returned QCE form) to ensure that the construction

return is correct. Where a return does not make it through the "validation gate" and no explanation is forthcoming, these returns will be imputed for strata 5 & 6 until an explanation or corrected figure is provided by the business.

Questionnaire error

Questionnaire error reflects the effect of question wording and form design on responses. Questionnaire error is minimised in QCE by including detailed completion notes and definitions on the questionnaire. Careful question and eform operation testing are also carried out in an attempt to minimise this error. A dedicated helpline is available to answer any questions or address any submission difficulties respondents may have.

Mode error

This describes the effect of different methods of administering a questionnaire on the recorded responses. Response to the QCE are collected via paper and eform and whilst the variables on both forms are the same, the two modes have a slightly different format. Also, as the survey approaches the close date, figures are also accepted over the phone. It is recognised that these changes can affect the recorded responses.

Data capture error

Information recorded on a paper questionnaire may be inaccurately converted to a format which can be interpreted by a computer. QBS paper questionnaires are scanned into the computer system by a third party, ITS Ltd, and under the terms of the contract scanning errors must be below 2%, so errors of this type are minimal. Where errors are made they are often identified and corrected (where appropriate) during the validation process. Also, over two thirds of businesses complete the QCE via eform, with the figures entered on the eform being uploaded straight to the system.

Reliability of Figures

One dimension of measuring accuracy is reliability, which can be measured using evidence from the analyses of revisions to assess the closeness of first published estimates and subsequent estimated values.

Users require data that are timely and can be accessed as close to the event which the data measures as possible, and data of good quality, where the picture painted of that event is most accurate. A policy of accepting revisions enables statisticians to provide users with data close to the event, but also improve the accuracy of that data as other information becomes available. Revisions are therefore a standard practice when producing official statistics.

Revisions

QCE data relating to the previous four quarters are provisional and subject to change. These revisions occur primary in light of late responses to surveys as well as revised or incorrect estimates from firms.

The series is also revised due to revisions to deflators and seasonal adjustment factors which are both re-estimated every quarter. Further information on the seasonal adjustment process can be found in the QCE background methodology paper.

Revisions Triangle

QCE produces a Revisions Triangle – this is a summary table which indicates the size and direction of revisions. The table presents a summary of the differences between the first estimates published and those published 3 years later for the same reference period. It is intended to help users understand the extent to which estimates are revised over time.

Our revisions policy is also published online for users to consult.

Timeliness and Punctuality
Timeliness refers to the time gap between publication and the reference period. Punctuality refers to the gap between planned and actual publication dates.

The NI Construction Bulletin is published approximately 3.5 months after the end of the reference period and is released as a statistical bulletin on the NISRA website. This is the minimum time that the NI Construction Bulletin can be produced in taking account of:

The need for firms to be given a sufficient time lag to allow them to fully account for their construction activity in the reference period and to make their return; and

The time required to carry out the necessary checking, validation and processing of the data before publication.

The NI Construction Bulletin publication schedule is available on the NISRA website and Gov.uk and provides 12 months advance notice of releases. The QCE results are published quarterly in January, April, July and October of each year.

In the unlikely event of a change to the pre-announced schedule, public attention would be drawn to the change via the NISRA website and the reason(s) for the change fully explained at the same time, as set out in the Code of Practice for Statistics.

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 metadata, illustrations and accompanying advice.

The Northern Ireland Construction Bulletin is available as a free to download PDF document on the NISRA website on the day of publication. A pre-announcement of the dates of the next four publications is also made on the NISRA website and Gov.uk. Hard copy versions of the Northern Ireland Construction Bulletin are also available on request.

The Northern Ireland Construction Bulletin contains a summary of main findings for the main construction output measures with commentary and graphs. The commentary provides information for each construction output measure on the changes from the previous quarter and the same quarter 12 months ago. The publication contains: tables for each construction output measure; graphs showing trend analysis going back five years and links to a Background Information Document; Structure of the Industry document; other relevant sources of information; details on methodology; coverage and data quality.

A general press release is also issued, along with an announcement on NISRA's social media channels.

Similarly, the tables contained in the bulletin are provided to users in different formats (such as Excel and OpenDocument Spreadsheet) on the NISRA website.

The NISRA Data Portal hosts a range of information and QCE construction output estimates by sector are available to access and download.

Access to the data is restricted. The confidentiality of the data is legally enforced by the Statistics of Trade and Employment (Northern Ireland) Order 1988. The survey metadata is not available to users.

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.

As far as is practical, the Northern Ireland Quarterly Construction Enquiry adopts common definitions and methodology to other similar Government surveys of businesses.

The definition of construction output applied in the Northern Ireland Quarterly Construction Enquiry is consistent with the definition used by the Office for National Statistics (ONS) in their Monthly Business Survey for Construction and in the publication of their GB Construction Output Statistics.

The Quarterly Construction Enquiry samples from the Northern Ireland extract of IDBR. The IDBR is a business register which contains information on all businesses in the UK which are VAT registered or operating a PAYE scheme. The IDBR is the sampling frame used for the vast majority of Government statistical surveys to businesses.

Firms are selected for the Quarterly Construction Enquiry from the IDBR on the basis of Standard Industrial Classification (SIC) 2007. SIC 2007 is an international classification system that categorises businesses by the type of economic activity in which they are engaged. SIC 2007 Divisions 41-43 of the IDBR relate to Construction activities. This includes general construction and specialised construction activities for buildings and civil engineering works. The sample for the QCE covers all businesses classified to construction under SIC 2007 Section F, Divisions 41-43 of the Northern Ireland extract of the IDBR (excluding sector 41.1 – Property Developers).

There is no other comparable source of information for Northern Ireland which measures construction output. The Construction Employers Federation (NI) carries out a State of the Industry survey which asks a sample of construction firms whether business is up, down, or about the same as a previous period.

A comparable time series for Northern Ireland Construction Output Statistics is available from Q1 2000 onwards.

Similar data on construction output statistics in Great Britain is provided by ONS, where in 2019, the Great Britain Construction publication was re-designated as National Statistics.

The GB data is derived from the Monthly Inquiry of Activity for Construction and Allied Trades carried out in GB by ONS. Whilst the QCE and Monthly Inquiry of Activity for Construction and Allied Trades are not identical, much of the sample design and methodology on both surveys are similar. A summary of the main sampling rules and methodology on both surveys can be found in the table below.

	NI Quarterly Construction Enquiry (QCE)	GB Monthly Inquiry of Construction Activity and Allied Trades
Frequency	Quarterly	Monthly
Sampling Frame	IDBR	IDBR
Target Population	Businesses classified to construction under Standard Industrial Classification (2007) Section F, Divisions 41-43 (excluding sector 41.1 – Property Developers)	Businesses classified to construction under Standard Industrial Classification (2007) Section F, Divisions 41-43 (excluding sector 41.1 – Property Developers)
Sample Design	Sample population is stratified by turnover with businesses with an annual turnover exceeding £5.25 million always being selected	Sample population is stratified by the employment size group and by industry (SIC) of businesses with businesses with 100 or more employees always being selected
Sample Size	Around 700	Around 8,000
Include Public Sector DLOs	Yes	No
Definition of Output	Same	Same
Base Year	Same	Same
Weighting and Estimation	Returns are weighted by: 1. Grossing factors which are computed for each strata derived by dividing the total number of firms in each strata population by the number of firms that returned for that strata	Returns are weighted by using the following: 1. Design weight based on the cell in which a business resides 2. Calibration weight based on register turnover
Deflators	Same	Same
Seasonal Adjustment Model	X13-ARIMA	X13-ARIMA

Output Quality Trade-Offs
Trade-offs are the extent to which different aspects of quality are balanced against each other.

There is a desire among users for the figures to be published as soon as possible after the data collection cycle is closed. Construction output data are updated quarterly to take account of late returns or revised data from firms, changes to grossing factors, quarterly updates to deflators and updates to seasonal adjustment. The published construction output figures are therefore subject to ongoing revisions and this is an inevitable outcome of the trade-off between the desire for timely and accurate information.

QCE produces a Revisions Triangle – this is a summary table which indicates the size and direction of revisions. The table presents a summary of the differences between the first estimates published and those published 3 years later for the same reference period. It is intended to help users understand the extent to which estimates are revised over time.

A copy of the Northern Ireland Construction Output Statistics Revisions Policy can be found online.

Assessment of User Needs and Perceptions
The processes for finding out about users and uses and their views on the statistical products.

NISRA has carried out a feedback survey on two occasions of recipients of the NI Construction Bulletin to assess user needs and to receive user feedback on the construction output statistics contained in the bulletin. A summary of their responses can be found online.

In April 2011, NISRA established a Construction Output Statistics User Group. The User Group comprises Government officials, economic analysts and construction Industry representatives. It is expected that the User Group will be the primary forum for assessing user needs and receiving user feedback on construction output statistics. A copy of the minutes of the meeting can be found online.

Additionally, results from the recent NISRA outputs consultation, which includes proposed changes to the QCE statistical bulletin can be found on our consultation page.

There is an ongoing feedback facility on the Construction Output Statistics website which allows all users to give their views on the construction output statistics.

Performance, Cost and Respondent Burden
The effectiveness, efficiency and economy of the statistical product.

The estimated cost to businesses in Northern Ireland in 2021/22 of completing the Quarterly Business Survey (which includes Quarterly Employment Survey, Index of Services, Index of Production and the Quarterly Construction Enquiry) was £130,989.11.

Efforts have been made in recent years to reduce the burden on businesses, such as rotating businesses out of the sample, data sharing with the annual Business Register and Employment Survey responses, accepting telephone responses, and most significantly introducing and promoting a webform option.

The burden to businesses due to statutory Government Statistical Surveys is also monitored by the Statistics Advisory Committee (SAC). Under the Statistics of Trade and Employment (NI) Order 1988, a Northern Ireland Department is required to consult this committee before carrying out a statutory survey of businesses.

Confidentiality, Transparency and Security
The procedures and policy used to ensure sound confidentiality, security and transparent practices.

NISRA follows the 'National Statistician's Guidance: Confidentiality of Official Statistics' in the collection and dissemination of construction output statistics.

Standard disclosure control methodology is applied to construction output data. This ensures that information attributable to an individual or firm is not identifiable in any published outputs.

The construction data collected from firms are stored on a secure network which is only accessible to staff working on the survey. All paper questions returned by firms are stored in secure cabinets and again are only accessible to staff working on the survey. All these staff are trained on the protocols for protecting and maintaining the confidentiality of the data.

Further Information

Further details about the methodology employed in the Quarterly Construction Enquiry can be obtained by contacting:

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