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 Official 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: 2018 Q4 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	4,919	87
2	125-549	2,965	169
3	550-2,099	989	180
4	2,100-5,249	258	120
5	5,250-10,499	79	77
6	10,500+	98	96
Total		9,308	729

Non-Sampling Error

Coverage error

The estimates produced from the QCE are subject to coverage error. The survey draws its sample from IDBR. 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

Not all firms sampled respond to the QCE. Because of this, the data are subject to non-response error. Non-response error is the difference between the results attained using the firms that responded, and the results that would have been attained if every sampled firm had responded to the survey.

To counter non-response error, a great deal of effort is spent maximising response in each strata. In order to maintain response rates, up to two written reminders are issued, after four and six weeks, to firms who do not return their forms promptly.

In addition, Telephone Response Chasing (TRC) is carried out on all non-returning firms who, despite these reminders, have not submitted a return within a further two weeks. Email reminders are issued where respondents have expressed the desire to be contacted in this manner. At the beginning of each survey year all new firms to the sample are contacted part way through the field work period to encourage participation and to assist firms in the proper method of completing the form.

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.

Standard errors

In practice, the standard error is often used as an indicator of sampling error (for more on sampling errors, see earlier section). The standard error gives users an indication of how close the sample estimator is to the population value: the larger the standard error, the less precise the estimator.

The Coefficient of Variation (CV) is the ratio of the standard error to the estimate, expressed in terms of a percentage. In general terms, the smaller the CV the higher the quality of the estimate.

CVs have been calculated for the main construction output measures (in current prices).

It is difficult to produce standard errors directly for seasonally adjusted series and for volume measures (real prices), but as the standard errors for the unadjusted series are indicators of quality, they will indicate something about the quality of the adjusted series too.

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.

Public Bodies with Direct Labour Operatives engaged in construction activity are given an imputed value if they do not make a quarterly return. The extent of these imputed values is approximately 1% of overall construction output at current prices.

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.

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.

The construction output statistics are revised quarterly. These revisions occur for a number of reasons: firms not returning forms on schedule; revised or incorrect estimates from firms; revisions to deflators and seasonal adjustment factors which are both re-estimated every quarter.

The Northern Ireland Construction Bulletin highlights revisions to the previously published estimates of the Northern Ireland Index of Construction, Index of New Work and Index of Repair and Maintenance, for the last six quarters.

Northern Ireland Statistics and Research Agency (NISRA) has also developed a revisions triangle for the Northern Ireland Index of Construction. This is designed to help users understand the extent to which estimates are revised over time. The revisions triangle presents a summary of the differences between the first estimates of growth published and those published 3 years later for the same reference period. These differences are tested to see if there is a significant difference between them.

Revisions are considered to be biased if the mean revision of the difference from zero is statistically significant. A standard t-test and modified t-test are used to compare the calculated bias in the Northern Ireland Index of Construction series (the mean revision) with the variability of the revisions. Thus far, the differences between the first estimates of growth published and those published 3 years later for the same reference period have been found to be not significant.

Spreadsheets have been developed giving revisions triangles of estimates for all quarters from Q1 2005.

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 Bulletin is 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 Official 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 Facebook page, on the ELMS Twitter feed and an infographic is also produced.

Similarly, the tables contained in the bulletin are provided to users in different formats (such as Excel, CSV and OpenDocument) on the NISRA website. A longer run of the construction output series in current prices and constant prices and seasonally adjusted from Q1 2000 onwards are available in excel and CSV format.

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 definition of output is contained in the Summary of Methods used to compile NI Construction Output Statistics document.

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.

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.

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 annual cost of carrying out the Northern Ireland Quarterly Construction Enquiry and publishing the Northern Ireland Construction Output Statistics is £80,000. This is mostly made up of staff costs but also includes the printing and postage of the survey forms. The estimated compliance cost/burden to firms participating in the survey in 2009/10 was estimated to be £51,681.

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.