

# Analysis of the Impact of Quarterly Employment Survey Data Revisions

March 2019

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## 1. Introduction

It is normal practice for Quarterly Employment Survey (QES) estimates to be revised. Data relating to the previous four quarters are provisional and subject to revision. Further information on standard revisions can be found [here](#).

There have been two further methodological changes to employee jobs estimates that have been included in the March 2019 release. These revisions result from:

- a periodic seasonal adjustment review (impacting on data from Q1 2005 to Q3 2018)
- improved methodology for the treatment of new businesses (impacting on data from Q1 2017 to Q3 2018)

In addition

- QES estimates for Q3 2017 have not been benchmarked to the annual Business Register and Employment Survey (BRES)

This paper summarises the impact of these changes on QES estimates.

Feedback and/or questions on these changes can be directed to [economicstats@nisra.gov.uk](mailto:economicstats@nisra.gov.uk).

## 2. Background to the QES

The QES provides short-term employee jobs estimates for NI and is used by the Office for National Statistics to calculate quarterly workforce jobs estimates for the UK.

Employee job estimates can be disaggregated by gender, working pattern (full/part-time), public/private sector, and industrial activity at the two-digit SIC level. Seasonally adjusted figures are available at section level, sector level (i.e. manufacturing, construction, services and other industries) and for the public and private sector series.

The QES has a sample size of approximately 6,000 businesses, is drawn from the Inter Departmental Business Register and comprises;

1. a census element which includes all public sector units, all private sector units with 25 or more employees and all private sector units with more than one industry activity.
2. a sample element which is a stratified random sample of businesses with fewer than 25 employees.

A fuller description of the QES methodology can be found [here](#).

### 3. Description of revisions

#### *i. Seasonal Adjustment Review*

Employee jobs estimates can be affected by events throughout the year, some work may be seasonal (for example shops may recruit more staff during the Christmas period) or there can be changes to the workforce that coincide with academic years. Jobs estimates from the QES are seasonally adjusted to account for such seasonal trends. Over time these trends can change, so seasonal adjustment models are periodically reviewed. Estimates released in March 2019 are based on an updated seasonal adjustment model.

The following series continue to be seasonally adjusted:

- Male employee jobs in Manufacturing (Section C); Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles (Section G); Transportation and Storage (Section H); Accommodation and Food Service Activities (Section I); Administrative and Support Service Activities (Section N); Public Administration and Defence, Compulsory Social Security (Section O); and Education (Section P).
- Female employee jobs in Mining and Quarrying (Section B); Manufacturing (Section C); Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles (Section G); Accommodation and Food Service Activities (Section I); Professional, Scientific and Technical Activities (Section M); Public Administration and Defence, Compulsory Social Security (Section O); Education (Section P); Human Health and Social Work Activities (Section Q) and Arts, Entertainment and Recreation (Section R).

In addition seasonality has now been identified:

- for female employee jobs in the Construction sector (Section F);
- for male employee jobs in the Arts, Entertainment and Recreation sector (Section R).

Seasonality has no longer been detected:

- for male employee jobs in Electricity, Gas, Steam and Air Conditioning Supply (Section D) and Professional, Scientific and Technical Activities (Section M);
- for female employee jobs in Water Supply; Sewerage, Waste Management and Remediation Activities (Section E).

**ii. Treatment of New Businesses**

The sample frame for the QES is the Inter Departmental Business Register (IDBR), a register of all businesses registered for VAT and/or PAYE. The IDBR contains a range of information on businesses, including a description of its main business activities (Standard Industrial Classification (SIC)).

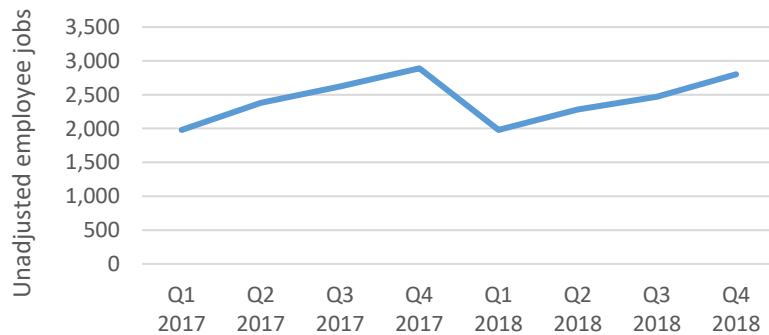
When a new NI business registers for VAT and/or PAYE it is added to the IDBR using data the business has provided to HMRC or Companies House. Where a business does not supply HMRC or Companies House with their industry description, the business is added to the IDBR using one of two general SIC codes - 'SIC 74 - Other professional, scientific and technical activities' or 'SIC 82 - Office administrative, office support and other business support activities'. Information from the monthly or quarterly IDBR proving survey or BRES is then used to confirm/update the SIC description.

Previously, the QES methodology involved removing from the results any businesses for which the exercise into confirming industry code was not complete, and changing the industry codes in the results for those businesses which had confirmed their industrial activity since being selected for QES.

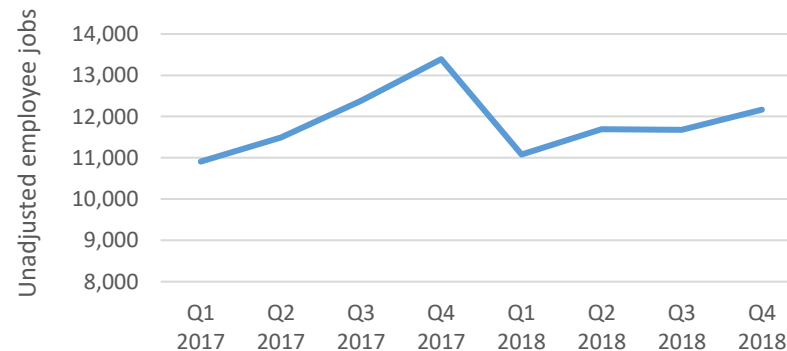
As this is a cyclical issue with employee jobs increasing each quarter from Q1 to Q4 each year and then a notable drop between Q4 and Q1 (see figures 1 and 2 below), it was possible to minimise this impact in the seasonally adjusted series for Sections M and N (which contain SICs 74 and 82) in the most recent seasonal adjustment model.

The impact of this change is mainly seen within SIC 74 and SIC 82, with a larger change in employee jobs in SIC 74 and SIC 82 between Q4 and Q1 in the unadjusted series than the seasonally adjusted series for sections M and N. This should be taken into consideration when assessing trends within SICs 74 and 82.

**Figure 1: Unadjusted Employee Jobs in SIC74 - 'Other professional, scientific and technical activities', Q1 2017 to Q4 2018**



**Figure 2: Unadjusted Employee Jobs in SIC82 - 'Office administrative, office support and other business support activities', Q1 2017 to Q4 2018**



### iii. **Benchmarking to BRES**

Benchmarking refers to a statistical technique used to improve coherence between estimates of the same variable – e.g. estimates of employee jobs which are compiled using different data sources such as quarterly and annual surveys.

Each year the BRES collects employee and industry information for businesses on the same survey date as the Q3 QES. The sample size varies on a four year cycle as follows – 12,000 – 30,000 – 12,000 – 70,000 businesses. More information on BRES is available [here](#). The total number of jobs as estimated from the BRES in 2017 was 1.0% or 7,735 higher than the QES Q3 2017 estimate.

The results of the two series differ for a number of reasons including;

- Sample design – the BRES sample is selected to produce results for industry by geography, the QES sample is designed to produce detailed industry estimates
- Sampling variability – both BRES and QES are sample surveys. As such estimates obtained from it are subject to sampling variability, meaning if we drew many samples, each would give a different result.
- Differences in estimation methods

Q3 QES data were benchmarked to BRES results every two years (for years with the larger sample sizes). Most recently QES was benchmarked to BRES 2011, 2013 and 2015, when the sample size was 30,000 or 70,000. QES data were not benchmarked to BRES 2012, 2014 and 2016 when the BRES sample was 12,000.

In the most recent benchmarking process the Q3 2015 QES estimate was lifted by 0.3% to the BRES 2015 total. The time trend between 2013 and 2015 was also adjusted to take into account the higher Q3 2015 total.

Although this process smoothed the data between the two benchmarked results, a step effect was notable between the Q3 2015 benchmarked results and the Q4 2015 to Q4 2016 series. As such the Q4 2015 to Q4 2016 series was subsequently revised, as described [here](#).

As the main usage of the QES is to report quarterly change in employee jobs and the two estimates remain close the decision was taken not to benchmark to BRES 2017. The difference between the two series will be monitored each year and the requirement for benchmarking will be kept under review, in particular in light of the BRES 2019 results.

The main impact is that

1. There is no change to the quarterly time trend from Q3 2015
2. The QES and BRES estimates for Q3 2017 differ by 1%.

#### 4. Impact of revisions

Figure 3 below shows the impact of both the standard revisions and the additional revisions detailed in this document. As shown in Figure 3, the impact of the revisions is small, with a lift in the series from Q4 2016 onwards. The biggest increase can be seen in Q4 2017, with an increase of approximately 3,000 jobs following revisions.

Figure 3: Seasonally Adjusted Employee Jobs, 2008 to 2018

