Data Explained

Characteristics of Trading Firms in Northern Ireland
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This project involved using novel datasets to estimate the impact of exports on the Northern Ireland economy and to investigate the difference between exporting and non-exporting firms in Northern Ireland.

Initial research questions

Our research involved two main questions:

- What is the nature of trading vs non-trading firms in Northern Ireland, at a detailed sectoral level?
- What is the scale of employment supported by exporting in Northern Ireland, and what is the nature of this employment, particularly with regards to gender?
Dataset and variables used

For this project, we accessed microdata from the Business Register and Employment Survey (BRES) for Northern Ireland, the Northern Ireland Annual Business Inquiry (NIABI), and Broad Economy Sales and Exports Statistics (BESES).

Because BRES data was unweighted and unable to be linked to the other datasets, we were ultimately not able to use any information from it. We used averaged data from NIABI and BESES covering the years 2016-2020. Data from NIABI and BESES was provided as a single linked dataset.

Data limitations encountered

Some issues were encountered during this project. Most significantly, BRES data did not contain any weighting variables and so it cannot be used to give reliable estimates. Even if weighting did exist, there was no consistency of the anonymised ruref indicator between BRES and NIABI/BESES, which means we could not match the BRES data to the other datasets. BRES contains information about gender splits and local unit employment. As a result, we were unable to use any information contained within BRES to answer our research questions, and instead used publicly available data to determine gender employment splits in Northern Ireland. We had not expected these issues at the project inception since BRES data from the Office for National Statistics (ONS) is weighted and matches via ruref to Annual Business Survey data.

Aside from issues with linkage and weighting, data access took several months due to delays in receiving and processing paperwork. Because applications need to go separately through Northern Ireland Statistics and Research Agency (NISRA) and ONS, access was delayed beyond our initial expectations.

Finally, as NIABI/BESES does not include data on financial services, analysis on Sector K is not included although Sector K is an exporting sector. NIABI/BESES also has limited information on the agricultural sector. However, we expected this issue at the project inception.

Necessary modifications to initial research questions or research design

Due to linkage issues with BRES, we were limited in our ability to answer questions regarding the nature of trading and non-trading firms. In particular, we were unable to regionalise firms in Northern Ireland using local unit data in BRES, and unable to use the granular BRES data to determine how employment by gender differs between exporting and non-exporting firms in Northern Ireland. However, we were able to use published data to estimate some of the gender impacts.

Necessary modifications to the data

For both NIABI/BESES and BRES, we created a variable which mapped SIC codes to the industry codes used in the Northern Ireland IO tables so that input output modelling could be performed. In order to avoid disclosure risks, these industry codes used in Northern Ireland IO tables were sometimes aggregated.
In order to use NIABI/BESES for our purposes, we created variables with appropriate weights applied. We also created dummy variables to indicate whether a firm was an exporter, and combined data across multiple years.

Four new variables had to be created for exports and imports of goods and services outside the UK. This was because the variables provided did not equal the sum of their individual components by economic area or sum together to equal the overall totals. The variables created were:

- **export of goods outside the UK** = export of goods to rest of EU (wq111) + export of goods to rest of the world (wq113) + export of goods to Republic of Ireland (wq114)
- **export of services outside the UK** = export of services to rest of EU (wq115) + export of services to rest of the world (wq117) + export of services to Republic of Ireland (wq116)
- **import of goods from outside the UK** = import of goods rest of EU (wq121) + import of goods from rest of the world (wq123) + import of goods from Republic of Ireland (wq124)
- **import of services from outside the UK** = import of services from rest of EU (wq125) + import of services from rest of the world (wq127) + import of services from Republic of Ireland (wq126).

The Export variable (total export value) in the dataset did not equal to the sum of variables wq112 (exports of goods outside the UK) and wq163 (export of services outside the UK). However, the Export variable was equal to the new goods and services export variables created by adding the exports by different economic area, as outlined above.

This was also the case for imports. Variable wq120 (total imports of goods and services from outside UK) did not equal to the sum of variables wq122 (import of goods from outside the UK) and wq164 (import of services from outside the UK). However, the total import variable was equal to the new goods and services import variables created by adding the imports by different economic area, as outlined above.

**Recommendations to data owners**

We are very pleased to see the integration of data on Northern Ireland into the ONS Secure Research Service (SRS). Even though Northern Ireland (NI) microdata is available, it is unfortunately of little use to many UK-wide research questions (even those with a regional focus) without it being integrated into the same workspace as the rest of the UK data (i.e. the SRS). Unfortunately, as a result, it appears to be commonplace for researchers to equate GB as the UK or produce NI results with little actual data. We therefore find it very encouraging to see NI data in the SRS and look forward to integrating it into future research.

Beyond this, a critical recommendation is that BRES data should have weightings provided. Without weightings this dataset is, at best, close to useless - and, at worst, is going to lead to researchers accidentally using incorrect, unweighted results. In our view, BRES provides an important utility to all other business datasets – using the local unit data allows us to regionalise results. Therefore, we recommend that reporting units (rurefs) match between BRES and NIABI/BESES, as is done in the equivalent ONS datasets.

We also suggest that variable descriptions are provided within the datasets for NIABI/BESES, as the variables are not provided with descriptions outside of the metadata. This makes using NIABI/BESES correctly a challenge and makes mistakes more likely.
**Additional data which would help to further develop the research**

In order to regionalise or explore gender further, we would need to be able to match BRES and NIABI/BESES data.

BRES weights would need to be provided.

Matching reporting units between the new Earning and Employees Study and NIABI/BESES/BRES would also allow us to understand how employment characteristics differ between different types of firms (e.g. exporters and non-exporters) without relying on industry averages. For example, we could better understand how people of different ethnicities, age groups, and skill groups are affected by exporting.

Introducing NIABI/BESES/BRES to the SRS would also allow us to match them to ONS datasets such as the Annual Purchases Survey.

**Please include code files used in your analysis**

A text file of our stata code is provided.

**Feedback on metadata, synthetic data and other documentation provided**

Variable descriptions in the dataset would be helpful, especially with the NIABI and BESES datasets, which use codes for variable names. BRES is easier to navigate without frequently checking the variable documentation, as the variable names are intuitive and descriptive.

Additionally, some variable names did not match their names in the metadata. For instance:

- Reporting_Unit_Employees was ruempe
- Reporting_Unit_Employment was ruempmt,
- Survey_Calibration_Weight was calwght
- Survey_Design_Weight was aweight.
Acknowledgements

Administrative Data Research Northern Ireland (ADR NI) takes privacy protection very seriously. All information that directly identifies individuals will be removed from the datasets by trusted third parties, before researchers get to see it. All researchers are trained and accredited to use sensitive data safely and ethically, they will only access the data via a secure environment, and all of their findings will be vetted to ensure they adhere to the strictest confidentiality standards. The help provided by the staff of Administrative Data Research Centre Northern Ireland (ADRC NI) and the Northern Ireland Statistics and Research Agency (NISRA) Research Support Unit is acknowledged. ADR NI is funded by the Economic and Research Council (ESRC). The authors alone are responsible for the interpretation of the data and any views or opinions presented are solely those of the author and do not necessarily represent those of the ADR NI. NISRA’s data has been supplied for the sole purpose of this project.

About ADR UK

ADR UK (Administrative Data Research UK) is a partnership transforming the way researchers access the UK’s wealth of public sector data, to enable better informed policy decisions that improve people’s lives. By linking together data held by different parts of government and facilitating safe and secure access for accredited researchers to these newly joined-up and de-identified data sets, ADR UK is creating a sustainable body of knowledge about how our society and economy function – tailored to give decision makers the answers they need to solve important policy questions. ADR UK is funded by the Economic and Social Research Council (ESRC), part of UK Research and Innovation.

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