

Our impact - Reviewing methods for regional GDP estimates



To uncover economic performance across the UK and drive sustainable growth

Project summary

Accurate and timely regional economic data is crucial for effective policymaking and informed decision-making at all levels. Understanding the economic performance of different regions and countries within the UK allows policymakers to identify areas of strength and weakness, target support to those most in need, and develop policies that promote balanced and sustainable growth. Businesses can also use this information to make informed decisions about investment, expansion, and resource allocation.

In recent years, the UK Office for National Statistics (ONS) has significantly invested in the development of new subnational statistics to support economic analysis and insight at a regional and country level. One of these innovations was the introduction of experimental Quarterly Country and Regional Gross Domestic Product (QCRGDP) estimates in 2019. These aimed to provide detailed, timely insights into economic performance at a regional level.

However, despite initial success, the series faced some challenges that led to a temporary suspension in 2023. ESCoE was then commissioned to complete a review of its methods and processes.

“We brought in independent experts from ESCoE to assess the current methods and data sources for producing Quarterly Regional GDP and how these might be improved. The ONS is focused on producing the high-quality data policymakers need, and this improved and reinstated dataset will be an important contribution towards that goal.”

Gemma Rabaiotti, Head of Quarterly Regional GDP Development, ONS

Impact - New recommendations

- The ONS are taking on many of our recommendations immediately, which will allow them to recommence publication of these figures for the nine English regions and Wales later in 2025. Recommendations taken forward include constraining to Annual Regional GDP, stricter revision windows and reviewing data sources for a number of industries.
- Estimates for Scotland and Northern Ireland are published separately by those countries, but will be incorporated in ONS's publication to give a UK-wide picture.
- The review also contains an analysis of the different approaches to estimation of quarterly growth by the ONS for UK Quarterly GDP, for Quarterly Country and Regional GDP and for Scotland by the Scottish Government. This highlights areas of difference that could be explored across producers to determine the most appropriate approach.
- Involving users and leveraging expertise across devolved governments and academic institutions will enhance the quality of statistics and user confidence in the outputs.

Project leads and partners



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Our impact - Measuring public sector productivity

To inform policy and spending on public health, education and defence



Project summary

Accurate measures of the value generated by public services are vital to understanding developed economies. However, measurement can be more of a challenge than in the private sector. This is because outputs are harder to define, and harder to measure, especially when they are provided free to users.

The 2005 Atkinson Review was a seminal milestone which has stood the test of time, with the Office for National Statistics (ONS) applying its principles in its measures of public service productivity. However, the landscape has changed in the last 18 years, especially due to the impact of the COVID-19 pandemic. Therefore, the Chancellor commissioned a new Review in 2023, published in March 2025.

This project informed ONS work to review and improve public sector productivity measurement, with ESCoE academics playing a key role in methods development.

Impact - New methods

This work has been used by the ONS to inform redevelopment of their suite of public sector productivity statistics.

For example, the research provides a framework for a more general assessment of preventative medicine, showing how the benefits of lifestyle classes offered to people with pre-diabetes can be included in measures of public sector output. Other work investigates how far it is possible to measure changes in the quality of defence capability.

Ultimately, better measurement of public sector productivity can guide policymaking and spending to improve these services. Therefore, this work has potential to bring significant benefits for the health, education and security of the nation.

“Public services compose 20% of GDP, so their accurate measurement is vital for public policy formation as well as international comparison. ESCoE research is directly informing how the UK is taking steps to remain international best in class.”

Richard Heys, Office for National Statistics

Project leads and partners



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Our impact - Developing the Management and Expectations Survey

Providing critical insight on the relationship between how businesses are managed and their productivity



Project summary

In 2017 and working closely with the UK Office for National Statistics (ONS), ESCoE researchers created the Management and Expectations Survey (MES) to analyse business management practices, current performance and future expectations. This is the largest ever survey of management capabilities in Great Britain, covering firms across industries, regions, firm sizes and ages.

In 2020, the Economic and Social Research Council (ESRC) funded an update to the survey to provide real-time insight on the immediate impact of COVID-19 on employment, investment and sales growth. Supported by HM Treasury, this survey was updated in 2023 to account for innovation by firms since the pandemic, particularly AI.

Analytical work has explored the relationship between management practices and firms' dynamic capabilities, their resilience to shocks and their forecasting ability. The surveys have also helped us develop a set of key findings about management practices.

"The Management and Expectations Survey research by ONS and ESCoE is an exemplar of collaborative work between government and academics. It has shed new light on how better managed firms outperform their peers in so many dimensions."

John Van Reenan, Chair of the Council of Economic Advisors to the UK Chancellor of the Exchequer and former ESCoE Research Associate

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Impact - New data asset

- Industrial strategy:** The research informs industrial strategy as it tells us about the mechanisms that support growth. Analytical work was included in the Competition and Markets Authority's recent response to the industrial strategy consultation.
- Measuring the public sector:** This work has informed the Public Services Productivity Review, a key piece of work to achieve the government's important aim to improve productivity in the public sector. Notably, it has led to the development of a new Public Sector Management Practices Survey.
- Government support schemes:** Government programmes like 'Help to Grow Management' support firms to improve their management practices. Our research informs these schemes by illustrating the difficulty of targeting business interventions and encouraging companies to take up support. It also illustrates the limitations of policy evaluations.
- Firm resilience:** Tracking firms over time during the pandemic showed how management practices have impacted firms' decision-making in response to economic shocks and uncertainty. Our work also supported the formation of WFH Research and the Survey of Working Arrangements and Attitudes.

Project leads and partners



Rebecca Riley



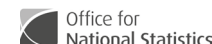
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Our impact - Making sense of skills

To inform labour market policies, address regional skill shortages and advise job seekers



Project summary

Before the start of this project, there was no available data on the skills that are commonly required in UK job adverts. As a result, there was very little understanding of skill shortages, skill specialities that exist in different regions in the UK or the skills required for given occupations.

ESCoE researchers developed the first publicly available data-driven skills taxonomy for the UK. A skills taxonomy provides a consistent way of measuring the demand and supply of skills.

Visualising the data

The taxonomy's data visualisations were shortlisted for an Information is Beautiful Award in the Science and Technology category.



"Nesta has provided evidence that this taxonomy can be valuable in comparing skills demand among employers to current skill supply among workers and the potential skills supply that will result from courses and learning programmes... to enable a coordinated approach to measure skills supply and demand." **World Economic Forum, 2019**

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Impact - New data and open-source code

- Our work has been used by the Office for National Statistics Classifications Team to inform their update of occupation classification codes. This improved how changes in job supply and demand are measured, strengthening the evidence base in a priority policy area for government and generating vital insight for HR policy development.
- Data science teams across government, including the Cabinet Office, use our system to understand evolving skill requirements and discover internal mismatches.
- Google Digital Garage used our skills taxonomy to create their Profile Builder. Building on this work, our research team launched the Open Jobs Observatory, supported by the Department for Education. This shares free, monthly insights on UK skill demands.
- The World Economic Forum report on "Strategies for the New Economy" cited the taxonomy as an emerging initiative for creating a skills-based labour market.
- Both our skills extraction library and the tools we built on top of it are open source for others to use. The algorithm can extract skills that have not been seen before, be adapted to your chosen taxonomy and can match to different levels of the taxonomy.

Project leads and partners



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Our impact - Developing a new LEED infrastructure for the UK



To deliver game-changing insight on the UK's labour market

Project summary

Linked Employer Employee Datasets (LEED) are a unique and valuable component of any country's data infrastructure. Linked data on workers and their employers allow for a more complete understanding of the dynamics of the economy and labour market than studying households or organisations alone.

The ability to track workers in firms over time allows the development of a range of indicators of labour market dynamics, such as hiring rates, separation rates and job-to-job flows. They also allow better understanding of the sources of earnings inequality and volatility and provide valuable insights into the "human side" of productivity.

The best LEED integrates longitudinal administrative data on all employers and employees with rich survey data. This infrastructure exists in the United States and in many European countries. However, the UK does not currently have research-ready data of this nature.

This project has firmly established the feasibility of developing a new LEED infrastructure for the UK, based around the administrative payroll data from HMRC's PAYE Real Time Information system.

"New LEED could generate valuable statistics on the geography and dynamism of the UK labour market, the relationship between productivity and wages and fill evidence gaps on a number of important issues across government."

Christina Palmou, Office for National Statistics

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Impact - New infrastructure

The development of a new LEED infrastructure in the UK would offer significant advantages over the existing UK employer and employee datasets by providing a comprehensive, longitudinal and data-rich perspective on employment.

This has potential to be a game-changer in improving understanding of a wide range of policy-relevant issues in areas such as: productivity and growth; business dynamism; wage dynamics; career progression; trade impacts; job quality and well-being.

The project sets out a roadmap for the development of new LEED:

Stage 1: Develop a linked employer-employee spine, containing unique and time-consistent identity linkages.

Stage 2: Match in employee and employer characteristics from administrative databases and surveys.

Stage 3: Use the spine as a sampling frame for new surveys to fill important data gaps.

This infrastructure would be periodically updated and curated in a transparent and replicable way, and made available to the research community as a public good under controlled conditions.

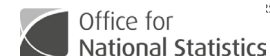
Project leads and partners



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Our impact - Measuring job quality

A step change in understanding the jobs on offer - for businesses and job seekers



Project summary

Understanding job quality - the aspects of work that affect employee well-being - is crucial for improving workforce conditions.

While research typically gathers insights through employee surveys and reviews, this ESCoE project explores whether indicators of job quality can be extracted automatically from online job adverts. Building on previous work, we developed an open source Python package to identify and categorise job quality indicators in job postings.

Using a taxonomy based on the Measuring Job Quality Working Group's seven dimensions of job quality, we designed a pipeline that classifies relevant sentences and maps them to categories such as employment terms (e.g. offers to work flexible hours), benefits (e.g. life assurance) and job design (e.g. mentions of career progression).

As part of this project, we also undertook a modernisation programme of related Nesta-ESCoE projects in order to make the code readily available. This means we now have open-source code libraries that can extract information, such as skills and company descriptions from job adverts, and map these to existing taxonomies.

Impact - New open-source code

- These indicators provide the first-ever timely and low-cost signal of job quality dimensions. The UK currently has no official measuring system for job quality, and the main indicator is an annual survey.
- While there have been several efforts to define the dimensions of job quality, there have been far fewer efforts to measure these dimensions. Our innovative methods offer an approach to quickly detect shifts in the prevalence of different benefits within jobs. They also provide a complementary source of data compared to other research that focuses on measurable outcomes of job quality in terms of worker well-being.
- Applied to a wider sample of job adverts, it gives researchers and policymakers a way to monitor aspects of the quality of jobs offered and could be used to track offered job quality in target sectors, on a specific dimension, or across the market as a whole.
- By releasing the code, both the Office for National Statistics and government departments (who hold their own datasets of job adverts) will be able to monitor aspects of job quality in any industry or occupation, and these novel measures will provide a useful complement to more traditional approaches.

Project leads and partners



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Our impact - Improving regional trade measurement

To understand the UK's internal market post-Brexit



Project summary

Regional economic performance and the devolution of power in the UK is an increasingly important topic. Shifts to more localised policy-making and Britain's exit from the EU demand better understanding of the operation of the UK's internal market, as well as the links between different parts of the UK.

However, a lack of interregional trade data has prevented detailed analysis. This means there is no, or very limited, data for understanding the supply chain linkages between the different nations and regions of the UK.

This project addresses this issue by developing a proposed framework for compiling interregional trade data on a consistent basis for countries and regions in the UK, and making other recommendations about the use of existing data sources and the development of new ones where appropriate. This has included recommending use of data sources collected by the Devolved Governments.

This work has led to further ESCoE work exploring some of these recommendations, such as developing a framework for Supply and Use and Input-Output tables for the four nations of the UK, which has in turn supported further impactful research.

"The Economic Statistics Centre of Excellence produced early estimates of interregional trade between Northern Ireland, Scotland and Wales for 2015, which led to the development of a framework for interregional trade data collection and estimation."

Chris Goldsworthy, UK Office for National Statistics (ONS)

Impact - New measurement frameworks

- Improved interregional trade flow data is vital for understanding regional economic policy and regional fiscal policy, and for monitoring the principle of 'no-detriment' which is central to UK devolution settlements.
- The ONS has now built upon this framework to produce a methodology for the production of interregional trade estimates for the 12 countries and regions of the UK. The first set of estimates on this basis were released early in 2025.
- The ONS plan to produce these on a regular basis, so this research has been fully translated into production in ONS.
- This provides a basis for further economic data for the countries and regions of the UK, such as the development of Supply and Use and Input-Output Tables by the OECD, which is also drawing on further ESCoE research on this topic.
- Our work has encouraged collaborative working between the ONS and statistical producers in Devolved Governments. This is building a collective understanding of the best methods for measuring trade on a regional basis. The positive outcomes from this have encouraged joint working to flow through into other projects.

Project leads and partners



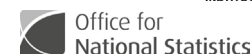
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Our impact - Improving real-time regional economic insights

Supporting key evidence-based decision-making for UK policymakers and businesses



Project summary

Understanding regional economic trends in real time is crucial for policymakers, businesses, and researchers. Traditional economic indicators are often published with significant time lags. This limits their usefulness for timely decision-making.

This project developed new methods for regional nowcasting - the real-time estimation of economic activity at the subnational level. By leveraging high-frequency data, machine learning, and innovative statistical techniques, ESCoE researchers provided more timely insights into regional economic performance.



“To demonstrate that ONS can adapt to the needs of the modern user and help policymaking...we made the decision to adopt the approach developed by the Strathclyde team, to help produce faster estimates of regional growth using their econometric model.”

UK Office for National Statistics (ONS)

Impact - New methods

By advancing macroeconomic methods to provide more accurate and timely information, this work has enhanced regional and national policymaking across the UK:

- The research enabled ONS to develop faster, more frequent regional economic estimates.
- ONS used these estimates to help inform their work as part of the previous government's Levelling Up strategy.
- The model has also been used by the Scottish Fiscal Commission to improve economic forecasting.
- Financial firms and media outlets, such as PwC and the Financial Times, have leveraged estimates to analyse regional economic trends and communicate them to the public.
- Our methods also provide consistent historical regional growth data back to 1970 that enables current regional growth to be set into an appropriate historical context.

Project leads and partners



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Our impact - Developing democratic measures of income growth

Innovative research leads France's Statistics Office to experiment with new measures of economic well-being

Project summary

Many people are familiar with Gross Domestic Product (GDP), a commonly used economic measure of national output. However, whilst GDP provides useful insights, it tells only part of our economic story.

In particular, GDP growth is not a good measure of welfare change; it does not reflect any changes in the distribution of income.

This ESCoE project develops a democratic measure of growth which represents the average of each household's growth experience. An advantage of this measure is that it can be easily explained to the general public and non-technical users.



"As a result of this research, we are introducing a new balanced growth indicator. At this stage, these statistics are considered experimental. ESCoE's contribution has had a significant impact on our work."

Sébastien Roux, INSEE (the French statistical office)

Impact - New indicators

- ESCoE work has directly led to the introduction of INSEE's "balanced growth indicator". This will be published on an experimental basis in 2025. Most indicators of income growth place more importance on the income growth of people with higher incomes compared to those with lower incomes. This new indicator gives an equal weight to each household's income growth. This will help to improve measurement of economic development in France.
- The methods in this work have been developed with significant engagement from experts at the European Economic Association, the Royal Economic Society, the Society for the Study of Economic Inequality, the International Association for Research in Income and Wealth, and the World Inequality Database.
- The methods and results have been presented widely at conferences and workshops and key aspects of the approach were described in a 2020 *Economica* article.

Project leads and partners



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Our impact - Communicating uncertainty in economic statistics



To improve public understanding

Project summary

Nearly all important statistics are actually an “estimate” – a statistical judgement that is subject to some degree of uncertainty. So how can we best communicate that uncertainty while still maintaining trust in the statistics themselves?

ESCoE researchers have measured data uncertainty and engaged with the general public to assess their understanding of economic statistics. The research has also discussed this important topic with producers of statistics and those who make decisions based on them. This has led to a number of recommendations to communicate uncertainty effectively.

Panel session on communicating uncertainty at ESCoE's Conference on Economic Measurement 2024



Impact - New communication methods

- This research is helping the Office for National Statistics (ONS) improve their communication of economic statistics. The Office for Statistics Regulation has reinforced the importance of this as part of their 2023 Review into the GDP revisions published in the Autumn of 2023.
- ONS has started to implement the research recommendations to improve communication of their highest profile economic statistics, such as GDP and international comparisons of UK productivity. This is increasing public understanding at this critical point for assessing the performance of the economy.

“Uncertainty is inherent to the measurement of the economy and developing ways of communicating it is an important area of focus. If the economic story changes, then this will always be big news and may affect public trust in economic measurement. This ESCoE project is contributing to discussions around this complex topic and recommending practical changes to help statistical agencies increase public understanding of economic uncertainty.” **Ed Humpherson, Office for Statistics Regulation**

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Our impact - Measuring the green economy

To support the economic transition to net zero



Project summary

The green economy is an economic model that measures the virtuous relationship between economic growth and environmental wellbeing to inform our understanding of the impact of production and consumption on the environment.

Economic and environmental measurement is essential to enable and track the move towards this model.

This ESCoE project will review the definitions underpinning estimates of the 'green economy' and create a new list of green activities. It will also identify and test new methods for identifying firms involved in environmental activities to help address the current lack of available data and inconsistencies with existing definitions.

Impact - New methods & definitions

- This work will compile a comprehensive list of UK firms engaged in the Environmental Goods and Services Sector / 'green economy' activities, with detail on their geographic and sectoral distribution.
- Better measurement of the green economy will deliver on the Office for National Statistics whole economy transformation workstream objectives.
- It will also help to inform policy and public debates, and build understanding of the scale of economic output associated with 'green' activities and the wider economic transition.
- Greater understanding of this area will support the UK's transition to net-zero by 2050.

"Environmental sustainability has never been more relevant. From the circular economy to the energy transition, policymakers are keen to understand how efforts to boost sustainability affect the economy. This project comes at a critical time, and is advancing our capacity to assess the scale of economic activity associated with greening the UK."

Will McDowall, Project Lead (ESCoE and UCL)

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